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UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURE

REPORT

OF THE

COLLEGE OF AGRICULTURE

AND THE

AGRICULTURAL EXPERIMENT STATION

OF THE

UNIVERSITY OF CALIFORNIA

FROM JULY 1, 1916, TO JUNE 30, 1917

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1917

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UNIVERSITY OF CALIFORNIA PUBLICATIONS

REPORT

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COLLEGE OF AGRICULTURE

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AGRICULTURAL EXPERIMENT STATION

OF THE

UNIVERSITY OF CALIFORNIA

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UNIVERSITY OF CALIFORNIA PRESS
BERKELEY
1917

THE COLLEGE OF AGRICULTURE

AND

THE AGRICULTURAL EXPERIMENT STATION

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REPORT OF THE DIRECTORS

BERKELEY, CAL., June 30, 1917.

To the President of the University of California:

The annual report of the College of Agriculture last year dealt chiefly with current research activities and results of investigations which the Experiment Station had been unable to undertake either through lack of time, facilities, or funds. This year the report deals chiefly with non-resident instruction, popularly known as extension work. It also includes a statement of some of the activities of the department made necessary by the great movement in which this country is engaged to increase the food supply for our allies.

THE COUNTY FARM BUREAU

The County Farm Bureau organization, which the College has been developing since July 1st, 1913, in co-operation with the U. S. Department of Agriculture, has proved of service in connection with the present great crisis, and has been largely extended through an allotment from the emergency appropriation given by Congress to the Secretary of Agriculture. The College has further supplemented this field of service by the use of a considerable number of the members of the staff who are ordinarily chiefly engaged in research or resident instruction. The willingness with which the members of the staff have adjusted themselves to meet these new conditions and the enthusiasm with which they have entered upon their new work is inspiring. It is rather surprising that a movement which is so far-reaching and which had to be built up without previous experience as a guide and without men trained in the details of the work has gone forward with so few difficulties. It is proposed now after a lapse of four years to discuss some of the broader aspects of the administration of this great movement and certain of the general and local difficulties which have arisen or may be expected to arise from time to time.

FARM ADVISERS

Naturally an important consideration is men. Since the aim of the farm adviser is to make available the researches of the United States Department of Agriculture and of the several experiment sta-

tions and allied investigational agencies, a sound scientific, as well as practical training for him is essential. The successful farm adviser must be trained in scientific methods; viz., must be able to weigh evidence accurately, and must be familiar with the actual findings of a fairly considerable body of agricultural investigations. Since it is not humanly possible for any man to keep intimately informed concerning all phases of agricultural knowledge, a prime essential to the success of a farm adviser is association with a large body of specialists to whom he can go for counsel and advice.

It is of course true that in any given county the agricultural practices of the more successful farmers are in advance of the average practice. Hence the first duty of the farm adviser is to study the practices of the successful men, and having carefully analyzed the reasons for their success to bring his knowledge to the less well informed. Here again a training in the scientific method of approach is of great importance. The author of a recent popular novel makes one of his characters speak of the British military officers as having "hearsay minds." This is a common failing of human beings and one which a farm adviser must be trained to avoid.

Valuable as it is, however, it is not enough merely to spread within the county the practices of the more successful farmers. "Water can never rise higher than its source." Progress must finally come to a standstill unless the successful are in some way made more efficient. These considerations have determined the general policy of appointing to the positions of farm advisers men scientifically trained, even though at the beginning they may lack that fund of experience in local practical affairs which is so essential to the highest success.

It was at once evident that the number of suitably trained men was limited. A further policy was adopted of training men for this work. This is done by appointing recent graduates as assistant farm advisers, and requiring two years of field experience before permitting them to act as farm advisers. This plan has been in operation for three years and has worked well.

It has been found that no matter how much training of a scientific or practical character a man may have, nor however successful he may have been in allied fields of work, he needs experience in this particular enterprise before being given charge of a county. In order to meet the present need for men caused by the Federal Emergency appropriation for Farm Bureau work, a plan has been adopted of appointing men of successful experience in agricultural methods as associate farm advisers and giving them some training under a farm adviser before placing them in charge of a county.

From the above discussion, it is obvious that many of the farm advisers are comparatively young men. Of the seventeen farm advisers, eleven registered for military service on June 5th, 1917. The average age of the seventeen men on July 1st, 1917, was 30.7 years. The comparative youthfulness, though a handicap in many ways, is not without its compensation. Only a man of great physical endurance can stand the work that the farm adviser is called upon to do. In addition to working all day, answering inquiries and visiting farms, the farm adviser must attend three night meetings each week on a definite schedule, from which he does not usually return until the middle of the night. For example, during the calendar year 1916 there were held 1886 meetings under the auspices of the Farm Bureaus in fourteen counties. In addition to this the farm advisers addressed 213 other meetings. The total attendance in all such meetings was 99,097, an average of 47.2 persons per meeting. Based upon this work each farm adviser each week visits 13.4 farms, holds 2.5 meetings with an average attendance of 47.2 and travels 286.6 miles.

THE BOARD OF SUPERVISORS

The method of financing of the office of the farm adviser is based on an idea to which public expression was first given by President Taft in an address in Kansas City in which he advocated that each of the two thousand or more agricultural counties of the United States should have an agricultural instructor financed jointly by the federal, state, and county governments. Not only has this method of financing been found to be sound but experience has shown that other methods of financing, such as money appropriated by commercial organizations, chambers of commerce, or associations of farmers, are unsound and sooner or later lead to difficulties of more or less serious character. Too much emphasis can not be placed on the fundamental character of this joint method of financing and upon the type of organization which follows from it. As time progresses and the significance of this unique relationship becomes better understood, it will probably have a marked influence on governmental policies in general.

Under the arrangement now constituted by law the funds for the support of the farm advisers are appropriated (1) by the Congress of the United States, (2) by the state legislature, and (3) by the county supervisors. Neither the Congress of the United States nor the state legislature is charged with the execution of laws, but separate branches of the federal and state governments are created for such purposes. The execution of this particular law is in the hands of the United States Department of Agriculture, representing the Congress of the

United States, and the colleges of agriculture, representing the state legislatures. In the counties there is no legally constituted agency which stands in the same relation to the appropriating agency as does the United States Department of Agriculture to the federal government or the college of agriculture to the state. It has been the policy therefore to look upon the Farm Bureau, although it is not legally so constituted, as standing in the same relation to the interest of the county as the college of agriculture to the state, or that of the United States Department of Agriculture to the federal government.

The general policy concerning the work within a county is worked out with the advice of the directors of the Farm Bureau. The supervisors determine whether it is a movement which they desire to support by an appropriation. If, after trial, the movement does not seem to be valuable, the supervisors may not reappropriate funds at the expiration of their contract, since the appropriation is entirely a voluntary matter. This actually happened in Ventura County. After the farm-bureau system there had been in operation for two and one-half years, the farm adviser was promoted to the position of assistant state leader and a new man assigned to the county as farm adviser. The Board of Supervisors promptly discontinued the work despite a written agreement made by them with the college of agriculture to continue the work for three years. This action may be expected to occur in different counties from time to time. Unless the farmers feel a definite and positive interest in the system after a thorough trial in a given county, it may well be questioned whether it should be continued.

In two instances, one officially, and one unofficially, the college was asked by the supervisors to remove the incumbent and appoint another farm adviser. In the first instance a public hearing was held to determine whether the farm adviser was satisfactory to the Farm Bureau members. The hearing indicated that the farm adviser was eminently satisfactory, and the supervisors not only accepted the verdict of the people but have since made an appropriation for an assistant farm adviser. In other words, the policy is to remove the farm adviser from a county if after a thorough *public* investigation he is found not to be serving the best interests of the county as determined by the farmers themselves.

There are inherent reasons why the legislative or appropriating power should be separate from the appointing and executive power, as is the case in the federal and state governments but which has not heretofore been the case in county governments. For example, the

farm adviser, acting under instructions of the federal and state agency, may be advocating cover crops, while a member of the board of supervisors in that county may be a fertilizer agent who feels that his business is not promoted by such advice. A supervisor may be a real estate agent. The farm adviser in the pursuit of his duty may pass adversely on a tract of land so far as it relates to the needs of a particular individual. A Farm Bureau may embark upon some policy such as pooling cream, which is contrary to the business interests of some relative of the supervisor. The board of supervisors may be supporting a chamber of commerce whose interests are not identical with those of the members of the Farm Bureau. All such points of contact are possible elements of friction and misunderstanding.

It is obvious that such conditions cannot be permitted to determine the appointment or continuance of a farm adviser. One of the most important facts concerning a farm adviser is that he represents an agency which does not try to direct or control the actions of any person and whose duty under the law is to discover the truth and disseminate it. It is essential that the farm adviser's position and his promotion shall depend upon the efficiency with which he carries out the purposes of this agency.

THE COUNTY HORTICULTURAL COMMISSIONERS

When the Farm Bureau system was introduced into California there already existed the county horticultural commissioner, who was performing, often with a considerable degree of efficiency, a portion of the work now done by the farm adviser. It is, in fact, to the credit of California that it had, in a measure, anticipated the coming of the farm-adviser system. It had been meeting its own needs in a local way as far as it could for many years before federal legislation instituted the nation-wide movement on a definitely organized basis. The county horticultural commissioner was the pioneer farm adviser, perhaps more accurately the pioneer horticultural adviser, and as such has done excellent service.

The legal duty of the county horticultural commissioner was and is the enforcement of the so-called horticultural laws of the state and the enforcement of the ordinances of the several counties relating to the control of insect pests, fungus diseases, rodents and weeds. Nevertheless, many of the horticultural commissioners have in the past found that they could serve the fruit growers more effectively by giving them advice than by performing police duties only. Indeed, such information often prevented the necessity for any legal action.

Furthermore, in many counties where fruit is not a leading industry there were few occasions for inspection duties or for legal action.[1]

The horticultural commissioner, being employed upon a per-diem basis, found it expedient to employ his time as an adviser. These officers were, and still are, probably of greater service as expert advisers concerning the control of insects, fungus diseases, and related matters, than in the performance of their police duties. Although there have been some notable exceptions, the farm adviser has therefore been looked upon generally as an intruder, for two reasons: first, the county horticultural commissioner, for reasons stated above, felt he had a prior right to perform these functions. Second, the fear, perhaps not without justification in some counties, that his income would be reduced. There are many instances where these two representatives have worked together harmoniously to the manifest advantage of each other and the welfare of the county, as should, of course, be the case.

In some instances, however, the county horticultural commissioners have definitely protested against the farm adviser's giving information concerning horticultural matters. However, the United States Department of Agriculture and the College of Agriculture have no option in this matter. These agencies are specially required by federal law to give information on any subject which their investigations make them competent to furnish. It is obviously in the interests of the public welfare that it should be so. The basic purpose of the farm adviser is to make effective the researches of the United States Department of Agriculture and of the several state experiment stations.

On the other hand, the college of agriculture or agricultural experi-

[1] This discussion was submitted to Mr. G. H. Hecke, State Commissioner of Horticulture, who after offering certain suggestions has given it his hearty approval. He says: "The new amendments to the Horticultural Code of California have already taken into consideration the fact that the coming of the farm adviser makes necessary a clearly defined division line between his duties and those of the county horticultural commissioner, and . . . is based upon the acknowledgment of the fact that the farm adviser is serving his county as a representative of a research and educational institution, while the county commissioner will confine his work to the police duties connected with his office and the office of the State Commission of Horticulture. The addition to the California Horticultural Code placing county horticultural commissioners in charge of the control of weeds and rodents, as well as the carrying out of fruit standardization, is a big step toward avoiding future complications between these two county officials. I am sure that the control of weeds and rodents opens up big avenues of activity to the county commissioner, which will give him plenty of work, and will have a tendency to avoid an overlapping of the duties of these two officials. I have not lost any chance or opportunity of calling the attention of the county commissioners to this fact, and they understand that, while formerly the county horticultural commissioner filled a dual rôle as police officer and as adviser, in the future we expect his duties to be so extensive that, as the farm adviser movement spreads, he will confine himself more and more to police work, as specified in the new amendments to the horticultural code."

ment station is not charged by law with the performance of police functions except in certain cases, and cannot therefore perform such duties except in these specified instances. It is quite certain that it is not in the interest of public welfare that it should be charged with any police duties. The execution of the laws of the state is the duty of the executive branch of the state, with the governor as its head, who executes the laws relating to agriculture through such officers as state commissioner of horticulture and the state veterinarian. The functions of the university, and hence of the college of agriculture, are research and education. It cannot be repeated too often that the college does not seek to control the action of any person. Its primary function is to determine the truth and to state it accurately.

Because the legal duties of the county horticultural commissioner were rather inconsequential in some of the less populated counties, the county supervisors have sought to combine the work of the horticultural commissioner with that of the farm adviser and thus save the expense of one of these officers[2]. It would probably not be legal for one man to occupy these two offices, but in such a case he would, as county horticultural commissioner, be responsible to the county board of supervisors, and as farm adviser, he would be responsible to the College of Agriculture of the University of California. It has not been deemed wise to permit such an arrangement.

The reason lies deeper than the obvious administrative difficulties. It lies in the fact that the usefulness of the farm adviser as such would be greatly lessened by putting him in the wrong attitude towards the persons whom he is required to serve. This point of view is a little difficult to comprehend at first because the farm adviser is a new type of employee. He is so novel that there has been great difficulty in finding an appropriate name for him. He is not the agent of the executive branch of the government, but the representative of a research and educational institution. He possesses no executive or legal power, but he serves an organization of farmers known as the County Farm Bureau. Through it he serves all the citizens of the county who are seeking to create wealth out of the soil. He is able to serve them not only through his own knowledge of the science and practice of farming but because he has behind him in the United

[2] The State Commissioner of Horticulture writes: "The duty of controlling weeds and rodents will make the office of Commissioner of Horticulture of sufficient economic importance to justify a reasonable per-diem salary, even if the county is less populated and perhaps insignificant in the line of horticultural production," and adds: "I entirely share your view as to the inadvisability of having two offices, the one of farm adviser and the other that of county horticulture commissioner, occupied by the same man. It would create serious administrative difficulties."

States Department of Agriculture and in the college of agriculture of his state a body of specialists whose investigations make them competent to give accurate information.

The County Farm Bureau, which is equally as important as the farm adviser, can do many things the farm adviser can not do. The farm adviser does not direct the Farm Bureau, but gives it the benefit of his advice. There is a possibility that the County Farm Bureau might embark upon some plan in which the farm adviser does not concur. However, thus far this has not been found an important practical difficulty.

The maintenance of both the county horticultural commissioner and the farm adviser is doubtless financially difficult for a number of the counties of the state. This fact probably justifies frank discussion of the relations of these two organizations and their future development.

The county supervisors are required by state law to appoint the county horticultural commissioner whenever a petition requesting his appointment is signed by twenty-five or more persons, each of whom is a resident, freeholder, and possessor of an orchard or greenhouse, or nursery, or rice field. The law provides that the compensation of the county horticultural commissioner shall be either not less than eighteen hundred dollars per year, or not less than six dollars per day when he is actually engaged in the performance of his duties. The salary of the deputy horticultural commissioners is five dollars per day, and the salary of inspectors three dollars and fifty cents per day.

The state law under which county supervisors are permitted to co-operate with the United States Department of Agriculture and the College of Agriculture is as follows:

"An Act (Laws of 1915, Chapter No. 373, signed May 18, 1915) empowering County Boards of Supervisors to appropriate and use county funds for the support and maintenance of Extension Work in Agriculture and the University of California. The people of the State of California do enact as follows:

"SECTION 1.—The Boards of Supervisors of the respective counties within the State are hereby empowered to appropriate and use county funds in not to exceed the amount of ten thousand dollars for any one year for the support and maintenance within their respective counties of extension work in agriculture under approval of the United States Department of Agriculture and in co-operation with the University of California."

Before placing the farm adviser in any county it is the policy, although not the law, to require at least one-fifth of the farmers to organize and join a Farm Bureau, to which each member pays one dollar annually to indicate his interest in the enterprise. This money is paid to and spent by the Farm Bureau. The County Farm Bureau

is managed by a board of directors—one member from each community in the county and four members elected at large, together with a president, vice-president, and secretary-treasurer. The units of a Farm Bureau are known as Farm Bureau Centers, there being not more than thirteen in any one county. These centers have regular local organization and hold meetings once a month. The farm adviser travels on a regular circuit among these centers, completing the trip once each month.

This organization being completed, representatives of the Farm Bureau request the supervisors to appropriate two thousand dollars annually for three years for the expenses of each farm adviser and one thousand dollars annually for the expenses of each assistant farm adviser permanently located within the county. The college maintains certain other itinerant assistants who go from county to county to take care of the "peak load," to whom it pays all expenses in addition to their salaries. The United States Department of Agriculture and the College of Agriculture of the University of California pay the salaries of all advisers and assistant farm advisers. Speaking generally, a farm adviser is available for each county in California having, in 1910, 500 farms, and a permanent assistant farm adviser for every 1500 farms in addition to the first 1500 farms.

It will thus be seen that in case twenty-five fruit-growers sign a petition requesting it, the county board of supervisors must maintain a county horticultural commissioner, while they may contribute the expenses of the farm adviser in case one-fifth of the farmers in the county have joined the Farm Bureau and paid an annual due of one dollar. The reason for the law requiring supervisors to appoint county horticultural commissioners grows out of the fact that in the absence of suitable authority vested in the State Commissioner of Horticulture, the appointment of a county official is needed to protect a county from the possible introduction of plant pests from other states. In addition to this appointment by the supervisors with salary and expenses, the county commissioner is appointed by the state commissioner to serve the state as quarantine guardian without pay, and in the inspection of incoming plant material from outside the state he is acting directly as his representative. Under the fresh fruit standardization act and the apple standardization act he is also acting under direction of the State Horticultural Commissioner.

The county horticultural commissioner performs three classes of duties:

1. He inspects as quarantine guardian plants shipped to California from other states. Under present regulations such shipments go

directly to their destination and are inspected by the horticultural commissioner or his deputy, often under difficult circumstances. In many cases to make an absolute diagnosis without serious injury to the shipment is well nigh impossible. This could be more efficiently done if the examinations were made at a few points of entry by agents delegated by the State Commissioner of Horticulture. Only a few men would be required for this work. They would soon come to have special expertness for it. It would be possible to provide proper depots so that materials could be inspected without injury and the plants fumigated or otherwise treated as occasion requires. If the proper legal relations existed between the State Commissioner of Horticulture and the county horticultural commissioner, the state commissioner could delegate certain county horticultural commissioners to perform this work.

2. The county horticultural commissioner is now charged with the enforcement of quarantines between counties in accordance with county ordinances. Recent legislation enacted at the request of the State Commissioner of Horticulture happily place the power of quarantining certain counties or districts exclusively within his authority.

3. The county horticultural commissioner is charged with the enforcement of certain state laws, but more particularly with that of county ordinances which the supervisors have adopted.

If the first two of these functions were placed in the hands of the State Commissioner of Horticulture, as the public welfare demands, then the question of whether or not the county should appoint men to enforce the laws and ordinances of local application may well be left to the county boards of supervisors. Without doubt a considerable number of counties in California need the services of such an officer.

Attention should be again called to the tri-party arrangement of the United States, state, and county in the case of the Farm Bureau system. Exactly the same reason exists for such an arrangement with reference to police regulations. The federal government already maintains quarantine officers in this state to inspect plants entering from foreign countries, and there exists a co-operative arrangement between the United States Department of Agriculture and the State Commissioner of Horticulture by which the same officers serve the purpose of both nation and state. The federal laws are sufficient to enable a federal officer to overrule either the work of the state or of the county horticultural commissioner in so far as relates to shipments of plants between states, or between counties. The way to avoid a possible clash as well as duplication of effort is to plan and put into operation a working arrangement between the federal, state, and county officers.

It is the one way to insure the efficiency and permanency of these three sets of officers and incidentally remove all excuses for friction which now occasionally arise between the county horticultural commissioner and the farm adviser.

STUDENT ATTENDANCE

From an industrial point of view this country has been engaged in the war since August, 1914. These new conditions have been reflected in the attendance at the colleges of agriculture in this country. For example, of the 637 students in the College of Agriculture of this University in 1915–16, 108 received degrees. Of the 529 remaining, 176, or 33 per cent, failed to return to college during the first semester of 1916–17. There were 314 farm school students at the University Farm during the year 1915–16, of which 63 graduated, while the 122, or 48 per cent, remaining, failed to return to the school during the first semester of this school year. Whether similar analyses have been made in other colleges is not known, but a study of the entering freshmen in many of the colleges shows that with few exceptions there has been a lessening attendance.

Reference in the last annual report was made to the fact that only 32 per cent of the students of the College of Agriculture came directly from farm homes. There is some reason to believe that the falling off in students has been chiefly from the cities, due on the one hand to greater industrial activities in the cities, which have readily absorbed them, and on the other hand, to the greater interest created thereby in commerce and mining engineering. It is believed that the interest on the part of farm-bred men is on the increase rather than otherwise.

The total enrollment of University students in the College of Agriculture for 1916–17 was 623 as compared with 637 for 1915–16. At the University Farm School it was 314, being the same as for 1915–16. There was greater activity than ever in the Farmers' Short Courses. There were 197 persons registered, compared with 181 in corresponding courses last year. The new course in farm tractors caused an additional enrollment of 53, making a total enrollment of 250 in these short courses.

Thus the total enrollment of residence instruction in agriculture for 1916–17 was 1187, compared with 1132 in 1915–16.

The interest in the correspondence courses in agriculture continues to be well maintained. During the year ending April 30th, 1917, 6248 persons registered for the twenty-five courses in agriculture. Previously 23,374 had registered, making a total registration to date

of 29,662. However, 8137 re-enrollments bring the total up to 37,759. During the year 3780 students completed one or more courses.

SPECIAL FORMS OF INSTRUCTION

The College of Agriculture has been developing brief courses of instruction to meet special interests. For example, the last week in December a course for veterinary practitioners was held at the University Farm School, with an attendance of 79 veterinarians. During the first week in January the wool growers had a convention at the University Farm, while in February the Berkshire swine breeders had a meeting and sale. The Citrus Experiment Station held a citrus growers' institute at Riverside in November, with an attendance of over 500. Two poultry short courses, one at Pomona and one at Van Nuys, were held in June, with a total attendance of 470 persons.

The Farm School Picnic, which has grown into a great farmers' field day, occurred this year on April 28th, with an approximate attendance of 14,500 persons. It was more educational than heretofore, and was a credit to the organizing ability and enthusiasm of the students, who are chiefly responsible for its conduct and success.

The College of Agriculture has farm advisers in eighteen counties, in which 218 farm bureau centers are organized, with a membership of about 6000 farmers. Certain allotments of funds from the Secretary of Agriculture will make it possible to extend this system rapidly in the near future.

The boys' agricultural clubs have been organized in more than one hundred high schools, with an average of about ten boys to a club, in which each boy is competing for a prize on the basis of net profit. Every two weeks during the period of this contest each of the boys receives written material for study concerning the crop or animal which he is raising.

As soon as it became evident that the boys' club movement in the high schools was succeeding, the college was strongly urged to extend the movement to the grammar schools. It has now made arrangements with fifteen boards of education by which in each of fifteen high schools an agriculturally trained teacher of agriculture will spend eleven months in the year at his work and will supervise boys' club contests in the grammar schools. Directly or indirectly the College of Agriculture, therefore, is coming in contact with boys between the ages of 10 to 14, with young men between the ages of 15 to 18, and with mature farmers. So far as they attend the college, either at Berkeley or Davis, the college also reaches young men between the ages of 18 and 23.

If all young men who intended to engage in farming came to college for instruction the present system would suffice. They do not, however; neither do they attend the farm bureau meetings, because these meetings are conducted by and are of chief interest to more mature people. The experiment is now proposed of establishing junior farm-bureau meetings composed of young men who are definitely out of public schools but who are not yet ready to take part in the farm-bureau meetings composed of older people. Thus, when this plan comes into full operation there will be a method of reaching all the mature farmers of the state and all boys 10 years of age and over, who desire to engage in agriculture.

This whole problem will be further influenced by the passage of the federal Smith-Hughes Act, one section of which provides money to be used for salaries of teachers in agriculture who shall spend at least one-half of the time in actual instruction on a farm. The administration of that act in the several states is through the state boards of education acting under the approval of a federal board.

BULLETINS AND CIRCULARS

During the year there have been published eleven Bulletins and fourteen Circulars, in addition to the Director's Annual Report, the Prospectus of the College of Agriculture for 1917–19, the Announcement of Courses in Forestry for 1916–17, the Farmers' Short Courses, September 24th to November 2nd, 1917, and fourteen special leaflets on food conservation. Altogether, 1,165,000 copies have been printed, of which approximately 900,000 have been distributed. The mailing list has increased from 31,000 to 35,800 addresses.

BULLETINS

Bul. 270. A Comparison of Annual Cropping, Biennial Cropping, and Green Manures on the Yield of Wheat. B. A. Madson.
Bul. 271. Feeding Dairy Calves in California. F. W. Woll and E. C. Voorhies.
Bul. 272. Commercial Fertilizers. P. L. Hibbard.
Bul. 273. Preliminary Report on Kearney Vineyard Experimental Drain, Fresno County, California. W. W. Weir.
Bul. 274. The Common Honey Bee as an Agent in Prune Pollination. A. H. Hendrickson.
Bul. 275. The Cultivation of Belladonna in California. Albert Schneider.
Bul. 276. The Pomegranate. R. W. Hodgson.
Bul. 277. Sudan Grass. B. A. Madson and P. B. Kennedy.
Bul. 278. Grain Sorghums. B. A. Madson.
Bul. 279. Irrigation of Rice in California. R. D. Robertson.
Bul. 280. The Economic Irrigation of Alfalfa in Sacramento Valley. S. H. Beckett and R. D. Robertson.

CIRCULARS

Cir. 152. Some Observations on the Bulk Handling of Grain for California. B. H. Crocheron and C. J. Williams.

Cir. 153. Announcement of the California State Dairy Cow Competition, 1916–18. F. W. Woll.

Cir. 154. Irrigation Practice in Growing Small Fruits in California. W. A. Hutchins.

Cir. 155. Bovine Tuberculosis. C. M. Haring.

Cir. 156. How to Operate an Incubator. J. E. Dougherty.

Cir. 157. Control of Pear Scab. R. E. Smith.

Cir. 158. Home and Farm Canning. W. V. Cruess.

Cir. 159. Agriculture in the Imperial Valley. A Manual for Settlers. W. E. Packard.

Cir. 160. Lettuce Growing in California. S. S. Rogers.

Cir. 161. Potatoes in California. J. W. Gilmore.

Cir. 162. Bacillary White Diarrhoea or Fatal Septicemia of Chicks and Coccidiosis or Coccidial Enteritis of Chicks. J. R. Beach.

Cir. 163. Some Fundamental Considerations Affecting the Food Supply of the United States. Memorandum Prepared for the Committee on Resources and Food Supply of the State Council of Defense. Thomas Forsyth Hunt.

Cir. 164. Small Fruit Culture in California. A. H. Hendrickson.

Cir. 165. Fundamentals of Sugar Beet Culture under California Conditions. R. L. Adams.

UNNUMBERED LEAFLETS

Observations on the Recent Agricultural Inquiry in California. Thomas Forsyth Hunt.

Canning Fruit in Glass Jars or Wax Top Cans. Frederic T. Bioletti and William V. Cruess.

Canning Fruits without Sugar. Division of Viticulture.

Canning of Fruit and Vegetables. Frederic T. Bioletti and William V. Cruess.

Canning Vegetables in Jars and Wax Top Cans. Frederic T. Bioletti and William V. Cruess.

Drying Winter Vegetables. Division of Viticulture.

Fruit Juices. Frederic T. Bioletti and William V. Cruess.

Jelly Stocks. Frederic T. Bioletti and William V. Cruess.

Living Expenses. M. E. Jaffa.

Preservation of Fresh Eggs. Division of Viticulture.

Preservation of Vegetables by Salt and Fermentation. Division of Viticulture.

Poultry as a Means of Conserving the Food Supply. J. E. Dougherty.

Growing Vegetables under Contract. Stanley S. Rogers.

The Farm Labor Situation in California. R. L. Adams.

NEW PROJECTS

The new projects outlined during the year are as follows:

No. 457. Relation of Oidium to the Keeping Qualities of Shipping Grapes. By F. C. H. Flossfeder reporting to F. T. Bioletti. At University Farm, Davis. Begun August 7, 1916.

No. 458. Orchard Soils Investigations. A Test of Mulches for Orchard Trees. W. L. Howard. Begun August 8, 1916.

No. 459. Orchard Soils Investigations. Effect of Tillage Practices on Soil Moisture Content and Growth of Trees. W. L. Howard. Begun August 8, 1916.

No. 460. Wool Investigations; Growth and Shrinkage of Six and Twelve Months Wool. Robert F. Miller reporting to Gordon H. True. At University Farm, Davis. Begun August 8, 1916.

No. 461. Miscellaneous Projects. W. W. Weir reporting to C. F. Shaw.

No. 462. The Cost of Pork Production when Grain is fed in Conjunction with Alfalfa Pasture. J. I. Thompson and E. C. Voorhies reporting to Gordon H. True. At University Farm, Davis. Begun August 21, 1916.

No. 463. Investigations to determine Causes of Spotted Growth in Barley Fields. C. B. Lipman and J. W. Gilmore. Laboratories in Berkeley. Begun September 14, 1916.

No. 464. Flax Investigations. B. A. Madson reporting to J. W. Gilmore. At University Farm, Davis. Begun September 14, 1916.

No. 465. The Rancher's Home Garden. S. S. Rogers. At University Farm, Davis.

No. 466. Fattening and Marketing Old Ewes. R. F. Miller reporting to G. H. True. At University Farm, Davis. Begun September 23, 1916.

No. 467. Demonstration of Method of Growing Raisin Grapes. S. P. Frissell and A. E. Way reporting to F. T. Bioletti. At Kearney Vineyard. Begun November 7, 1916.

No. 468. Potato Improvement by the Hill Selection and Tuber-unit Method to Determine its Practicability for the Truck Grower. S. S. Rogers and E. B. Babcock. At University Farm, Davis. Begun May 29, 1917.

No. 469. Table Grapes for the San Joaquin Valley. A. E. Way reporting to F. T. Bioletti. At Kearney Vineyard.

No. 470. Pollination Studies. Staff of Division of Pomology reporting to W. L. Howard. At University Farm, Davis, laboratories in Berkeley and orchards of the State. Begun November 24, 1916.

No. 471. Fruit-bud Formation and Development. Staff of the Division of Pomology reporting to W. L. Howard. At University Farm, Davis, laboratories in Berkeley and orchards of the State. Begun November 24, 1916.

No. 472. Studies in Dairy Production by High-Producing Cows. F. W. Woll and Miss Cora J. Hill reporting to G. H. True. At University Farm, Davis. Begun December 6, 1916.

No. 473. Whole vs. Ground Grains as Feeds for Young Dairy Calves. F. W. Woll and E. C. Voorhies reporting to G. H. True. At University Farm, Davis.

No. 474. Investigations of the Efficiency of the "Calf-Way" Milking Machine. F. W. Woll reporting to G. H. True. At University Farm, Davis.

No. 475. Preparation of Volume Tables for Principal California Species. D. Bruce reporting to Walter Mulford. Chiefly in Berkeley.

No. 476. The Development of a Practicable Dendrometer. D. Bruce reporting to Walter Mulford. In Berkeley. Completed.

No. 477. Cover Crop Breeding. L. D. Batchelor reporting to H. J. Webber. At Citrus Experiment Station, Riverside.

No. 478. Miscellaneous Drainage Investigations. W. W. Weir reporting to C. F. Shaw. Portions of State needing drainage.

No. 479. Soil Survey of Santa Maria Area. E. B. Watson (U. S. D. A.) and A. Smith reporting to C. F. Shaw.

No. 480. Reconnaissance Soil Survey of Southern California Area. Portions of Los Angeles, San Bernardino, Riverside, Orange, San Diego Counties. L. C. Holmes (U. S. D. A.) and others reporting to C. F. Shaw.

No. 481. Soil Survey of Ventura Area. J. W. Nelson and others reporting to C. F. Shaw.

No. 482. The Use of Pepsin as a Substitute for Rennet in the Manufacture of California (Granular) and Cheddar Cheese. H. S. Baird reporting to C. L. Roadhouse. Begun December 29, 1916.

No. 483. Is a Given Soil Type in Different and Far Separated Regions of California of the Same Nature in all Respects? Robert Pendleton reporting to C. B. Lipman. At laboratories and greenhouses in Berkeley.

No. 484. To Determine the Relative Value of Milo in Different Forms for Pork Production. J. I. Thompson reporting to G. H. True. At University Farm, Davis.

No. 485. Skim Milk vs. Whey in Pork Production. J. I. Thompson reporting to Gordon H. True. At University Farm, Davis.

No. 486. A Study of the Thermal Death Point of Bacillus botulinus, especially in Relation to the Sterilization of Canned Vegetables. W. V. Cruess in co-operation with the State Board of Health, reporting to F. T. Bioletti.

No. 487. Prune Studies. Staff of Pomology. Begun March, 1917.

No. 488. The Cumulative Effect of Cropping. G. R. Stewart and others reporting to J. S. Burd.

No. 489. A Detailed Study of the Effect of the Barley Plant on the Soil Solution. D. R. Hoagland and G. R. Stewart reporting to J. S. Burd. At Berkeley.

No. 490. Study of the Relation of the Concentration of Nutrient Solutions to the Growth of the Barley Plant in Sand and Water Cultures. The Relation of Solution to Absorption and Forms of Combination of Important Elements. D. R. Hoagland reporting to J. S. Burd.

No. 491. Studies in Soil Moisture. E. E. Thomas reporting to W. P. Kelley. At Whittier, California.

No. 492. The Fruit Bark Beetle. H. J. Quayle, A. F. Swain, reporting to H. J. Quayle, Riverside, California.

No. 493. A Synopsis of the Aphididae of California. A. F. Swain reporting to H. J. Quayle, Riverside, California.

No. 494. Manufacture of Concrete Irrigation Pipe. S. H. Beckett and Roy Wray reporting to Frank Adams. At University Farm, Davis.

No. 495. Studies in Adaptability and rate of Growth of Trees at the Santa Monica Forestry Station. W. Metcalf reporting to W. Mulford. At Santa Monica Forestry Station. Begun March 21, 1917.

No. 496. Studies in Adaptability and Rate of Growth of Trees at the Chico Forestry Station. W. Metcalf reporting to W. Mulford at Chico Forestry Station.

No. 497. Methods and Cost of Distributing Milk with Special Reference to Oakland, Alameda and Berkeley. E. Mead.

No. 498. Survey of Proposed Bishop Drainage District. W. W. Weir reporting to C. F. Shaw.

No. 499. Grape Syrup as a Substitute for Sugar in Canning. Division of Viticulture reporting to F. T. Bioletti. At Berkeley, Davis and various canneries.

No. 500. A Survey of Utilization of Garbage for feeding Swine in California. F. M. Hayes and P. T. Petersen reporting to C. M. Haring.

No. 501. Increasing the Lamb Crop on the Range. G. H. True and R. F. Miller reporting to G. H. True.

No. 502. Investigation to find the Relative Value of Wheat, Hulled Rice and Paddy Rice as Grain Feed and of Wheat Shorts vs. Rice Polish in Mash for Laying Hens. By J. E. Dougherty. At University Farm.

No. 503. Study of Adaptability and Availability of Wood for Treenails. By M. B. Pratt reporting to W. Mulford.

No. 504. Canning and Preserving Fruit Without Sugar. W. V. Cruess reporting to F. T. Bioletti.

No. 505. Economical Drying of Wine and Table Grapes. F. C. H. Flossfeder and A. E. Way reporting to F. T. Bioletti.

No. 506. A Study of the Manufacture of Cheese and Whey. By H. S. Baird. University Farm, Davis.

No. 507. Drying Vegetables. Division of Viticulture reporting to F. T. Bioletti.

No. 508. Home Drying of Fruit. W. V. Cruess and F. C. H. Flossfeder reporting to F. T. Bioletti.

No. 509. Preservation of Vegetables with Salt. By W. V. Cruess reporting to F. T. Bioletti.

No. 510. Entomological Field Work. E. R. DeOng reporting to C. W. Woodworth. At University Farm.

No. 511. Preservative Treatment for Wood Silos. By J. B. Davidson and H. L. Belton reporting to J. B. Davidson. At University Farm, Davis.

No. 512. Reconnaissance Soil Survey of the Upper San Joaquin Valley. By J. W. Nelson and E. C. Eckmann reporting to C. F. Shaw.

There are submitted herewith a series of reports covering the activities of the Division of Agricultural Extension, together with several discussions growing out of the agricultural inquiry made by direction of the Committee on Resources and Food Supply of the State Council of Defense, as follows:

The Field Work of the College of Agriculture. Warren T. Clarke.

General Summary of Farm Adviser and Farm Bureau Work in 1916. B. H. Crocheron.

Agriculture Clubs in California. B. H. Crocheron.

The Agricultural Inquiry. David N. Morgan.

Observations on the Recent Agricultural Inquiry in California. Thomas Forsyth Hunt.

Summary of the Reports of the Field Parties conducting Agricultural Inquiry, April 16–27, 1917.

I. Southern California. L. D. Batchelor.
II. Central Counties. B. H. Crocheron.
III. South Coast Counties. W. T. Clarke.
IV. Inyo County. V. C. Bryant.
V. Eastern Counties. W. L. Howard.
VI. North Coast Counties. T. Francis Hunt.
VII. North Central Counties. H. E. Van Norman.
VIII. Northeastern Counties. G. H. True.
Irrigation Survey. Elwood Mead and Frank Adams.

Ever since the United States was declared to be in a state of war, the department by your instructions has considered it its first duty to serve the federal and state governments in promoting the increased production by field measures. This new activity has necessitated some change of direction and emphasis in the research work of the station.

On April 12, 1917, the members of the staff throughout the state were called into conference. A committee was appointed to classify the projects then in progress into those which should be continued and those which could be temporarily abandoned because of the emergency. Obviously certain projects must be kept going at all cost, since a break in the continuity of the work would be fatal. A committee was also appointed to procure suggestions from the divisions regarding emergency investigations to be undertaken, and to pass upon their relative importance. About a dozen emergency projects were started and eighteen other projects have been passed upon favorably and will be carried on as time and funds permit.

Very truly yours,

THOMAS F. HUNT.

THE FIELD WORK OF THE COLLEGE OF AGRICULTURE

By W. T. Clarke

The work of the Division of Agricultural Extension has included land examinations, field demonstrations, extension schools, farmers' institutes, single lectures, running an agricultural demonstration train, exhibits at fairs and other shows, organization of women's clubs and special home economics demonstrations and lectures, county farm adviser and farm bureau work, and agricultural clubs in the schools.

During the past year the work has grown to such proportions that it has been necessary to put on certain Extension specialists to meet the demand. This demand for special work has come from both the counties that have county farm advisers and from the counties that do not have farm bureau organizations. These specialists have filled a long felt need in doing effective extension work and have been a valuable addition to the Division.

FARMERS' INSTITUTES

Farmers' institutes have been held in the counties which do not have county farm advisers insofar as the farmers have demanded these institutes and petitioned for the same. Twenty one-day institutes have been held in the various unorganized counties of the state and five two-day institutes, with a total attendance of 1843.

Farmers' institutes are not held in the counties where there are county farm advisers, and this, together with the fact that a large number of them have been replaced by field demonstrations and single special lectures, accounts for the fact that the number of institutes this year was not as great as in previous years. The farm advisers took part in 1902 meetings, including 1689 farm bureau meetings, with a total attendance of 94,306 persons.

SPECIAL INSTITUTES

During the past few years there has been a tendency for farmers' institutes to become more specialized, and growing out of this we gave during the past year a few special institutes where only one subject was discussed during the entire time. A notable example of this was the Fig Institute held at Fresno, January 12th and 13th. There was a total of five meetings where nothing was discussed except

various phases of the fig industry. This meeting was attended by practically all the fig growers throughout the San Joaquin Valley. The average attendance at each meeting was approximately 350, making a total attendance of about 2000.

SINGLE LECTURES

During the past year there have been given by various members of the staff, under the auspices of this Division, 430 lectures, with a total attendance of 33,938. These are given largely in connection with various clubs, granges, and other local agricultural organizations. Some subject of special and timely interest is usually discussed at these lectures and the audience is also given an opportunity to ask questions along the lines of discussion. In this way they have considerable value in bringing before the people the services of the College of Agriculture and also in imparting specific information along the lines of the subject being discussed.

FIELD DEMONSTRATIONS

Following up the general policy of giving special work which is of timely interest, a great many field demonstrations have been given during the past year. These demonstrations use up from one-half day to a day's time. The usual form of giving demonstrations is for the demonstrator representing the College of Agriculture to give a short discussion in some building such as a school house, or often in the open field, and then proceed to give some special line of demonstration.

Demonstrations were given last year of latest methods of pruning vines, of all ages, pruning of all kinds of deciduous fruits, control of various insect pests and plant diseases, demonstrations of the control of hog cholera, selection of all kinds of live stock, and a great many farm home demonstrations, such as canning, drying of fruits, etc.

The total number of demonstrations during the past year was approximately 69, aggregating a total attendance of 3061.

MOVABLE SCHOOLS

In some localities there has been given during the past year a special Extension School along some special line of farming. These schools last from three to five days, holding from two to three sessions per day. These are modeled somewhat after a farmers' institute, but specialized to the extent of only studying one subject, together with its allied phases. They also consist of a great deal of demonstration work. These schools give the farmer of the locality an opportunity to get acquainted with the instructors and also gives the instructors an

opportunity to get acquainted with the farmers' conditions, so that the chances for doing real service and imparting practical information is greater than where a single lecture or a single institute is held.

Owing to a limited number of workers and funds, only two of these schools were given during the past year, with an average daily attendance of 69, aggregating a total of 696.

FAIRS

During the past year various educational exhibits were prepared by the Extension Division showing the results of some of the investigational work of the Experiment Station and the educational work of the College of Agriculture. Five exhibits were prepared for state and county fairs and one permanent exhibit. Excepting the permanent exhibit these exhibits were all accompanied by specialists that presented certain lines of work that would be of special value to that particular locality. Judging the different agricultural exhibits, including livestock, was also a part of the work done at these and other fairs.

DEMONSTRATION TRAIN

During the month of May a special Agricultural Preparedness Train was run through the states of Utah, Nevada, and California, over the Los Angeles and Salt Lake Railroad. This train was a cooperative arrangement between the Utah Agricultural College and the Universities of Nevada and California, and the Los Angeles and Salt Lake Railroad. This station had two cars in the train, *i.e.*, a car of beans and a car of forage crops. The plan for operating this train was to spend one day in each town, keeping the train open each day and holding an evening meeting each evening. The total number of people passing through the train was 55,000. The total attendance at the evening meetings was 2949. This shows that the train was well attended and did very effective work.

LAND EXAMINATIONS

The Extension Division is constantly receiving requests to examine ranches. These requests come from varied sources—from the new settlers who are not familiar with California conditions, city people who want to go on the land, non-resident owners, and persons who desire help to "stop leaks" in ranches in operation. In doing this work the department has adopted the policy of gladly rendering service to anyone who is trying to make wealth from the soil. In order to facilitate the work the problem to be investigated should be presented to the Extension Office either in person, by mail, or by phone, in order

that the advisability of examination, and the specialist from the office best adapted to do the particular piece of work in question may be determined. Problems are investigated and opinions given regarding agricultural questions, but valuations are not placed on properties for obvious reasons. Nor are differences arbitrated between buyers and sellers of property.

During the past year the Extension staff have examined a large number of properties, which vary in size from the five-acre suburban tract up to ranches of 5000 acres. The larger number of requests for examination are ranches of from 30 to 160 acres.

Three men on the staff are in a position to do this work, and each of the men has made on an average of from one to four examinations a week. During the last year more than 100,000 acres of land have been examined and reports given thereon. This does not include visits made to sections to investigate diseases, insect pests, and soil problems that may be prevalent in some particular section of the state.

FARM HOME MANAGEMENT PROJECT

Farm Home Lecture-Demonstrations.—The work in California during the fiscal year 1916–1917 has been directed chiefly to lecture-demonstration work in the conservation of farm home products. The records of this work show that 355 lectures and lecture-demonstrations have been given in more than three-fourths of the counties of the state, with a total attendance of 12,708 housekeepers. The records also show that 40 per cent of the lessons have been given on canning; 20 per cent on jelly making; 16 per cent on balanced rations; 11 per cent on salads; 7 per cent on left-overs. The remaining 6 per cent covers a variety of subjects suggested by special needs. Mimeographed copies of the recipes used in the lessons are sent to housekeepers upon request, besides the printed bulletins and circulars available.

The field service deals directly with the problem of living—how to get the most and best out of the products of the farm with the greatest economy of money, material, and labor. Instruction on the subject of conservation of farm products includes canning, preserving, pickling, jelly making, candied fruits, drying fruits, drying and salting vegetables, preserving of eggs, use of left-overs, etc. In canning, the work covers all the meat and poultry, fruit and vegetables produced on the farm. California housekeepers are now conserving for family use, beef, veal, pork, Belgian hare, chicken, turkey, duck, fish, squabs, and in soup, beef, veal, and turtle. To add a variety and increase the supply, combinations are made in the canning. In the fruit work

wild and cultivated fruits are combined, giving a more satisfactory product than either used alone.

Extension Clubs for Farm Women.—There are at present 57 women's clubs in California directly in touch with the Extension Division of the College of Agriculture. Twenty-six of these Agricultural Extension Clubs are studying farm home problems by means of regular program study work. The total membership of these clubs is 595 farm women.

The object of these clubs is to study farm home problems; to develop leadership; to study and to use parliamentary law; to promote social life; to create and nourish community activities and civic pride; to form a stable support for Extension service. The main part of the year's program must relate to household subjects. Papers are read at each meeting of the club, followed by some discussion. When the club is not too far distant from Berkeley, six free lectures a year are given. These lectures include the lecture-demonstration work on conservation of farm products, balanced rations, kitchen equipment and kitchen methods, labor-saving devices, and farm sanitation. When these lectures are given an open meeting is held and the entire community is invited by the club. This organized group of workers banded together for mutual helpfulness furnishes a school where country women may receive Extension instruction. It is the connecting link between the country home and the Extension Division.

LETTERS

During the past year the Extension Division has written 28,162 letters, while the total number written by the staff of the College of Agriculture, not including the farm advisers, was 104,000. Most of these have been requests for information regarding some problem that has arisen in connection with some farming operation. For the most part these are inquiries of a specific nature and require a like answer. Two hundred and twenty-three letters were received from prospective settlers from outside of the state, seeking reliable information regarding farming conditions in this state. A great many inquiries were also received each week from people within the state who are considering going farming, seeking information regarding some particular locality or some particular line of farming. The handling of this correspondence, together with making out reports and sending out publications, required the maintenance of a large office force.

GENERAL SUMMARY OF FARM ADVISER AND FARM BUREAU WORK IN 1916

By B. H. Crocheron

Organization.—In the fourteen farm adviser counties of California there are 5312 farmers who are Farm Bureau members and who co-operate with farm advisers in their work. One new county, Imperial, has been successful in completing this organization and securing the $2000 appropriation from the Board of Supervisors during 1916. One other county, San Luis Obispo, has completed its Farm Bureau organization with over the required number of members, but has been unable as yet to secure the necessary appropriation from the supervisors. During the past year, the chief development within the Farm Bureau has been the organization of departments which will undoubtedly prove of great value in that: (*a*) they combine in one organization all persons interested in all phases of agriculture, while at the same time they permit of the joining together of all those interested in one particular phase of agriculture; (*b*) they prevent the formation of other local agricultural organizations which would encroach on the work of the Farm Bureau and might even threaten its existence. Departments have been formed in the Farm Bureau counties of California as shown in the following summary:

Cow-testing departments	2
Cow-testing associations which may become departments	4
Dairyman's department (milk and cream weighing and testing)	1
Cream pooling departments	2
Swine breeders' associations	1
Poultry raisers' department	1
Purchasing and marketing department	1
Farm loan departments (several on way)	1

Projects.—The 104 separate projects which the farm advisers have started up to December 1, 1916, may be grouped into the following 13 general classes and 46 sub-classes:

	No. of Counties
I. Rural economics:	
Highway tree planting	2
Telephone service extension	1
Electric power service extension	1
Rural road improvement	1
Control of storm waters	2
Brush burning on hillsides	1
Hill forestation	1
Total number	10
II. Farmers' organizations:	
Hog raisers' and swine breeders' association	3
Dairy, cow-testing and cream-pooling associations	8
Winter vegetable union	1
Lima bean growers' associations	2
Beemen's association	1
Total number	15
III. Boys' agricultural clubs:	
High school agricultural clubs	3
Elementary school agricultural clubs	3
Total number	6
IV. Agricultural fairs	1
V. Home economics	2
VI. Soil treatment:	
Subsoiling	1
Deep plowing	1
Prevention of erosion by terracing	1
Soil drainage	2
Fertilization	13
Liming of soils	4
Alkali reclamation	1
Cover crops	4
Total number	27
VII. Crop rotation	2
VIII. Animal husbandry:	
Dairy improvement	1
Hog cholera control	2
Pig management	1
Total number	4
IX. Forage crops:	
Sorghum	3
Alfalfa culture	2
Winter forage crops	1
Sweet clover	1
Total number	7

	No. of Counties
X. Cereal and field crops:	
Rice	3
Australian wheat varieties	1
Barley culture	1
Bean culture	1
Total number	6
XI. Orchard and vineyard work:	
Pruning	4
Trellising grape vines	2
Tree record work	2
Orchard management	1
Total number	9
XII. Farm pest control:	
Spraying orchards and vineyards for insects and fungus diseases	4
Weed eradication	2
Squirrel and gopher extermination	5
Total number	11
XIII. Farm bureau:	
Legislative committee	1
Increasing attendance at center meetings	1
Assistant farm adviser's work	1
Directors' meeting program	1
Total number	4

Campaigns.—A number of very successful Farm Bureau campaigns for the control of various farm pests, diseases of animals, the improvement of rural conditions, etc., have been conducted during the year. Among these may be mentioned: Control of hog cholera, grasshopper pest, and rice weeds, squirrel destruction, formation of storm districts for the control of flood waters, installation of septic tanks on the farms, improvement of rural schools, and construction and use of silos.

Demonstrations.—Among the demonstrations of special interest are: The use of cover crops in orchards, the growing of Sudan grass, growing alfalfa on hillsides, growing of winter forage crops, the spraying of orchards for insect pests and fungus diseases, the best methods of pruning vines and fruit trees, the use of fertilizers on alfalfa land, the trellis pruning of seedless raisins, varieties of rice adapted to different localities, scientific cooking demonstrations.

AGRICULTURE GROUP

Important Lines of Progress.—The most important lines of progress accomplished during 1916 were:

(*a*) The additional employment of assistant farm advisers, thereby relieving the farm advisers of the peak load which, for some seasons, they have been compelled to carry. The plan permits certain individuals to devote their whole time to a single project which needs special attention for its speedy accomplishment. It has also provided a force of young men selected for the purpose a definite training for farm adviser work.

(*b*) The completion of the project system of outlining work to be accomplished and in better office organization whereby this could be followed up.

(*c*) The increased organization of Farm Bureaus through their subsidiary departments, which united many interests under the one banner.

(*d*) Undoubtedly, also, a distinct line of progress has been in the bettering of the farm demonstrations and the distinct increase in their number during the past year. Experience indicates that several years are required before most men can become sufficiently well acquainted with the problems of their county to adequately demonstrate the solution of these to the farmers. It is among the longer established members of the force that the best demonstration work is being done, which leads us to conclude that in sufficient time, we will have it adequately worked out elsewhere.

STATE SUMMARY OF FOURTEEN FARM ADVISER COUNTIES FOR ELEVEN MONTHS

Different farmers visited on their farms	5,142
Total number farm visits made	9,157
Calls on farm adviser at office relating to his work	9,930
Meetings held under auspices of farm bureau	1,689
Total of all meetings in which farm adviser took part	1,902
Total attendance at such meetings	94,306
Membership in county farm bureaus	5,312
Boys' and girls' clubs organized in 1916 in farm adviser counties	40
Total membership in such clubs	437
Agricultural observation parties conducted	54
Total number persons in such parties	1,211
Farmers treating seed oats for smut	24
Acres of oats sown with treated seed	3,140
Farms on which farm adviser knows that alfalfa was sown, following his suggestions	213
Total acres of alfalfa so sown on above farms	1,771
Farms on which farm adviser knows that winter or hairy vetch was grown, following his suggestions	87

Acres of winter or hairy vetch so grown	1,284
Orchards cared for in whole or in part on suggestion of farm adviser	573
Trees in orchards so cared for	309,736
Registered sires (all kinds) purchased	81
Registered cows purchased	78
Cow-testing associations organized	5
Cows tested for milk production through such associations	13,376
Animals tested for tuberculosis by farm adviser or on his suggestion	3,476
Animals vaccinated for blackleg by farm adviser or on his suggestion	4,219
Hogs vaccinated for cholera by farm adviser or on his suggestion	7,372
Silos constructed	94
Crop rotation systems planned and adopted	131
Drainage systems planned and adopted	50
Irrigation systems planned and adopted	30
Acres included in these drainage areas	14,220
Acres included in these irrigation areas	2,640
Farms using chemical fertilizers	56
Tons chemical fertilizer so used	262.75
Tons of lime or limestone used	5,389
Acres of clover and other legumes plowed under for green manure	2,880

AGRICULTURE CLUBS IN CALIFORNIA

By B H. Crocheron

For four years agriculture clubs have been steadily organizing and working in California, until now there are 208 clubs in as many schools, with 2716 school boys and girls growing crops on farms under the direction of the University. The movement for agriculture clubs in California started on its present basis in January, 1914, with the students of the College of Agriculture, who, having an agriculture club of their own, felt that there were boys in the state too young to go to college, or who had missed the opportunity, but who would like to take part in growing contests with crops or animals and so demonstrate their ability to make money on the farm. With the aid and co-operation of the Extension Division, a committee of over forty students launched the campaign for agricultural clubs, which were at that time restricted to pupils of high-school age. The movement was then confined to secondary school boys, because: (1) they were less numerous than the vast army of elementary school boys and thus could be more adequately reached; (2) they were nearly of vocational age and therefore might be expected to respond to the money-making aim of the clubs; (3) they naturally looked up to the college students who were to be their volunteer leaders. From the first these clubs had a rapid growth. All during the long, hot summers hundreds of high-school boys demonstrated their ability and desire to grow crops on California soils.

The fundamental assumptions on which the agriculture clubs started were: (1) that the agricultural institutions of the state and nation had information which, applied to farming, would increase farm profits; (2) that many boys and some girls want to make money by farming and want to be shown how, and (3) that the chances for individual success are increased when several persons in the same neighborhood undertake the same work, an added interest for which comes through competition. Unless the above three assumptions are correct the idea of agriculture clubs in California is unsound.

All boys in any one club grow the same crop, but different clubs must grow different crops because of the highly divergent character of agriculture in the state. Twenty-four possible contests were

planned, selection being left to the club on the basis which might be expected to result in the most monetary profit to that particular community. Gradually, through the experience gained, the contests selected have narrowed down to about a half dozen.

In the first year the boy seldom grows a crop of much profit, but by the second year lessons have been learned which, applied in the field, give larger profit. By the third year the boy begins to see that only by unusual care and attention can unusual yields be obtained. Boys then often conduct seed selection or even plant-breeding demonstrations in addition to their regular plot and often extend the area of these plots far beyond the acreage required by the contest until they become large field projects.

No prizes of any kind for club work are offered by the University. It is evident, however, that the work has the enthusiastic approval of the people of the state, since each year they have subscribed large prizes. The chief prize offered has been a trip to the University Farm at Davis. Thus in 1914, 143 boys were there in camp; in 1915 there were 250; and in 1916 almost 300. At Davis the boys camped out for three days in militia tents, were entertained by the college, and spent the time in receiving agricultural instruction. In 1915 the trip also included a visit to the Panama-Pacific Exposition in San Francisco, while in 1916 they journeyed by special train to Berkeley and the campus of the University. For three years the communities have sent a carload of the high-school prize winners of the agricultural clubs on a 9000-mile tour around the continent in order to study the various types of agriculture in America, as well as to see some of the big cities, industries and places of historic interest. The tour is definitely organized for agricultural instruction in order to train leaders for country life in California. Of course, no boy of the contest really "wins" or "earns" a transcontinental tour. It is an investment made by the people in the expectation that in later years he will give a return to the community far beyond the expenditure. More than anything else, country life needs leaders trained from among their own people. Some of these leaders in the future will come from the "Transcontinental Tour Boys."

From the beginning the intention has been to extend the agriculture clubs to the sixth, seventh, and eighth grades of the elementary schools as soon as the high-school development became fixed and as soon as sufficient trained supervision could be obtained. It has been found necessary for the success of agriculture club boys that they should be visited at least once a month on their home farms during

the growing season in order to give them the encouragement and advice necessary to make their work a success, also to send them printed instructions and definite information on the crop they are growing at regular intervals of two weeks. While the University could furnish sufficient supervisors to oversee competently the work of the high-school boys, the problem of directing similar work in the elementary schools seemed too broad to be attempted.

But there are in California forty-nine high schools which employ instructors in agriculture, all trained men. Most of these are employed but nine or ten months a year. During the two or three months when farming operations are most active, these instructors are absent from their communities or remain there inactive in leadership. It was finally proposed to employ such instructors for three months in co-operation with the high-school boards. Where this is done the agricultural instructor from the high-school agrees to spend three months in agricultural extension activities in the district tributary to his high-school; the high-school board agrees to appropriate not less than two hundred dollars for expenses; the College of Agriculture, in co-operation with the United States Department of Agriculture, agrees to pay two hundred dollars salary for the work so done. In 1916, fifteen high-schools and their instructors entered into such an agreement. For 1917–18, it is proposed to extend the plan to forty-five such districts.

With the development of the high-school movement, the high-school club members became desirous of organizing elementary school clubs in the country roundabout and exercise volunteer supervision within their territory in the same fashion as earlier the University boys went out among the high schools. Napa County took the initiative in 1916 when boys from the Napa High School were placed in charge of rural elementary clubs conducted under their direction. This volunteer supervision acting under the direction of paid leadership has worked out successfully wherever tried.

The number of clubs organized in the high schools since the beginning of the work is as follows:

1914	343	1916	1157
1915	684	1917	1896

The number of boys enrolled in high-school clubs since the beginning of the work is as follows:

1914	37	1916	103
1915	71	1917	101

To the 1917 figures should be added elementary agricultural club enrollment of 820 boys in 107 clubs in the 15 high-school districts, making 2716 who in 1917 are growing crops in agricultural clubs.

No such system of agricultural clubs has been devised by any other state. While the number of secondary school boys enrolled has been comparatively small, the plan has been so sound that a greater proportion of the boys complete the contests than elsewhere. In 1915, 82 per cent of the boys who enrolled in the contests successfully completed them and passed in reports of their work, while in 1916, 57 per cent so finished. The 1917 crop season is still in full swing, but it is evident that the principle involved will again demonstrate its value. This has been partly due to the close supervision which the agricultural clubs throughout California are given by the men employed for the purpose and to the enthusiasm and help of the students in the higher institution. We may confidently expect the extension of the scheme whereby, under the guise of clubs, California boys raise real crops on real farms.

THE AGRICULTURAL INQUIRY

MADE BY DIRECTION OF THE COMMITTEE ON RESOURCES AND FOOD SUPPLY OF THE STATE COUNCIL OF DEFENSE

By David N. Morgan

At the first meeting of the State Council of Defense, held in Sacramento April 6th, 1917, a Committee on Resources and Food Supply was formed, with the following members:

Charles H. Bentley, San Francisco.
B. B. Meek, Oroville.
Miss Ethel Moore, Oakland.
John A. O'Connell, San Francisco.
Pres. Benj. Ide Wheeler, Chairman.

On April 10th, this committee held its first meeting in California Hall, University of California. Besides the members of the committee, there were present by invitation:

E. T. Ford, of W. R. Grace & Co., San Francisco.
S. P. Frisselle, Superintendent Kearney Ranch, Fresno.
G. H. Hecke, State Horticultural Commissioner.
Victor Henderson, Secretary Board of Regents and Secretary of the Committee.
Jas. Irvine, representing California Development Board.
Stoddard Jess, First National Bank, Los Angeles, Cal.
Dr. Chas. C. Keane, State Veterinarian, Sacramento.
H. S. Maddox, Secretary State Horticultural Commission.
S. B. McNear, Vice-President Sperry Flour Co.
J. M. Perry, President State Agricultural Society, Stockton.
G. H. Powell, Manager California Fruit Growers' Exchange, Los Angeles.
C. E. Rachford, U. S. Forest Service, San Francisco.
Dr. W. A. Sawyer, Secretary State Board of Health, Sacramento.
D. D. Waynick, representing Graduate Students, College of Agriculture.
Thomas Forsyth Hunt, Dean of the College of Agriculture.

And the following members of the faculty of the College of Agriculture:

Professors: W. T. Clarke, B. H. Crocheron, J. W. Gilmore, C. M. Haring, M. E. Jaffa, C. B. Lipman, E. Mead, D. N. Morgan, W. Mulford, W. E. Packard, C. F. Shaw, G. H. True, H. E. Van Norman, R. S. Vaile, H. J. Webber, and C. W. Woodworth.

On motion of John A. O'Connell, it was voted to refer to the College of Agriculture the following topics for consideration:

1. Investigation of the normal requirements of the people of the state for food and the sources of supply.
2. The normal surplus of staples.
3. The facilities for holding reserves.
4. An estimate of the current crop.
5. Animal and sea foods.
6. Possible substitutes for food usually imported.
7. Conservation of food and elimination of waste.
8. The advisability of land-settlement legislation.

In securing these data the College of Agriculture was requested to co-operate with "The State Statistician, the State Horticultural Commission, State Market Director, and such other state, federal, and other agencies as Dean Hunt may find available." The U. S. Forest Service, the State Commission of Horticulture, the State Board of Health, State Veterinarian, State Market Director, the Sacramento Valley Development Board, and the California Fruit-Growers' Exchange were among the agencies that assisted in this work.

The Governor of California also issued the following proclamation, in which he asked the co-operation of all the citizens of the state:

Whereas, an emergency in our National and State affairs now exists in which it is desirable to have full information concerning the production, distribution and supply of food in the State of California; and

Whereas, the committee on resources and food supply of the State Council of Defense has directed the Department of Agriculture of the University of California, assisted by the State Department of Agriculture, State Department of Horticulture, Health, Veterinary, State Market Director, the United States Forestry Service and other agencies, to hold meetings in the various counties of the State, and to the end that the desired information may be expeditiously obtained.

Therefore, I, WILLIAM D. STEPHENS, Governor of California, do direct that such hearings be held and I call upon the producers and distributers of foodstuffs to set aside their usual occupations in order to attend the conferences at the places and dates between April 16th and 23rd already announced in the various counties.

In accordance with these instructions, eight parties were organized, with the personnel shown on page 45, which, between April 16th and 27th, held hearings in fifty-five counties in California. As the data were collected by the field parties they were mailed to the College of Agriculture, where they were tabulated and digested by a committee consisting of Professors John W. Gilmore, Elwood Mead, and the writer. Each field party prepared a special report on its particular district, which will be found on pages 72 to 95.

On May 22nd, the Dean of the College of Agriculture made a report to the Committee on Resources and Food Supply on the broader aspects of the inquiry, which was ordered printed under the title, "Some Observations on the Recent Agricultural Inquiry in California," (p. 50).

As stated above, hearings were held in every county in this state except three. The members of the staff of the College of Agriculture conducted these hearings, being ably assisted by the State Commissioner of Horticulture and representatives of his office, and the offices of the State Veterinarian, State Board of Health, and the United States Forest Service.

Some federal or state officer in each county was charged with the responsibility of arranging for the meetings. In counties where farm advisers are employed, the farm advisers, with the assistance of their farm bureaus, made the necessary arrangements. In other agricultural counties the horticultural commissioners handled the arrangements in a gratifying manner. In the mountain counties the United States Forest supervisors ably performed this service.

The newspapers, telephone companies and theatres all co-operated in advertising the meetings. The plan called for a forenoon meeting of twelve farmers representative of the various districts of the county. These farmers met in a round-table conference, giving information to the visiting investigators. The subject matter for discussion at the afternoon meeting was decided upon.

There follows herewith answers given at these morning conferences to the twenty-two questions asked:

1. Crops: Per cent of normal acreage:

(*a*) *Alfalfa:*

Normal in Amador, Butte, Contra Costa, Eldorado, Lake, Los Angeles, Mono, Placer, Santa Cruz, Shasta, Sutter, Tuloumne, Yolo, and Yuba. Alameda, 110 per cent; Calaveras, 65; Colusa, 115; Fresno, 80; Glenn, 120; Imperial, 135; Inyo, 105; Kern, 75; Kings, 80; Lassen, 95; Madera, 80; Merced, 75; Modoc, 90; Monterey, 90; Nevada, 110; Riverside, 95; Sacramento, 85; San Bernardino, 80; San Diego, 108; San Joaquin, 90; Santa Clara, 85; Siskiyou, 105; Solano, 120; Stanislaus, 60; San Bernardino, 125; San Diego, 150.

(*b*) *Barley:*

Normal in Amador, Butte, Colusa, Eldorado, Imperial, Inyo, Kern, Modoc, Nevada, Plumas, San Joaquin, Shasta, Solano, Trinity. Alameda, 30 per cent; Calaveras, 95; Contra Costa, 30; Fresno, 25; Glenn, 130; Kings, 55; Lassen, 110; Madera, 48; Mariposa, 70; Mendocino, 110; Merced, 50; Monterey, 85; Orange, 65; Placer, 75; Sacramento, 115;

San Luis Obispo, 105; Santa Clara, 50; Siskiyou, 103; Stanislaus, 90; Sutter, 115; Tehama, 110; Tulare, 35; Tuolumne, 50; Yolo, 125; Yuba, 115.

(*c*) *Oats:*

Normal in Amador, Butte, Fresno, Glenn, Inyo, Kern, Lassen, Modoc, Plumas, Shasta, Solano, Tehama, Trinity, Tuolumne, and Yuba. Calaveras, 85 per cent; Eldorado, 90; Imperial, 60; Los Angeles, 75; Madera, 48; Mariposa, 60; Merced, 85; Monterey, 110; Riverside, 50; San Bernardino, 125; San Diego, 150; San Joaquin, 80; Santa Clara, 50; Siskiyou, 110; Stanislaus, 80; Sutter, 90.

(*d*) *Wheat:*

Normal in Amador, Butte, Colusa, Imperial, Kern, Nevada, Plumas, Sacramento, Solano, Tuolumne, Yuba. Calaveras, 90 per cent; Eldorado, 50; Fresno, 20; Glenn, 120; Inyo, 120; Kings, 25; Lassen, 105; Los Angeles, 75; Madera, 48; Mariposa, 75; Modoc, 120; Monterey, 90; Placer, 90; Riverside, 50; San Bernardino, 125; San Diego, 150; San Joaquin, 120; San Luis Obispo, 115; Santa Clara, 50; Shasta, 110; Siskiyou, 105; Stanislaus, 120; Sutter, 80; Tehama, 80; Trinity, 105; Yolo, 75.

(*e*) *Rice:*

Butte, 110 per cent; Colusa, 136; Glenn, 190; Madera, 800; Fresno, 130; Sutter, 25; Yolo, 144; Yuba, 600.

(*f*) *Sugar beets:*

Normal in Kings, Monterey, Orange, San Diego, San Luis Obispo, Santa Barbara. Alameda, 130 per cent; Los Angeles, 110; Marin, 50; San Bernardino, 50; San Jose, 85; Santa Cruz, 60; Stanislaus, 90; Sutter, 400; Tulare, 95; Ventura, 102; Yolo, 233; Yuba, 400.

(*g*) *Truck crops:*

Normal in Calaveras, Contra Costa, Fresno, San Luis Obispo, San Mateo, and Santa Clara. Alameda, 150 per cent; Imperial, 118; San Diego, 140.

2. Are there poor stands of grain to be plowed under?

Ans. No, in all counties except Calaveras, Kings, Modoc, Sacramento, San Joaquin, Solano, and Tulare.

3. Would silos increase livestock carrying capacity?

Ans. Yes, in all counties, except Orange and Santa Barbara.

4. Are materials available for building silos?

Ans. Yes, in all counties except Imperial and Inyo.

5. How many acres of young irrigated orchards?

Calaveras, 125 acres; Colusa, 3000; Contra Costa, 500; Del Norte, none; Eldorado, 2500; Fresno, 20,000; Glenn, 3500; Inyo, 1200; Kern, 4000;

Kings, 7000; Lassen, 200; Los Angeles, 25,000; Madera, 3000; Mariposa, 20; Merced, 2000; Modoc, 35; Mono, none; Monterey, 2000; Nevada, 300; Placer, 3000; Riverside, 18,000; Sacramento, 5000; San Benito, 4600; San Bernardino, 23,000; San Diego, 2500; San Joaquin, 2000; San Luis Obispo, 100; Santa Clara, 4000; Santa Cruz, 1000; Shasta, 1000; Siskiyou, none; Solano, 300; Stanislaus, 2000; Sutter, 42; Tehama, 1000; Tulare, 500; Ventura, 5850; Tuolumne, 330; Yolo, 500; Yuba, 2000.

6. How many acres of young unirrigated orchards?

Calaveras, 250 acres; Colusa, 5000; Contra Costa, 2000; Eldorado, 1000; Glenn, 200; Humboldt, 500; Lake, 1000; Marin, 200; Merced, none; Mono, none; Monterey, 1100; Napa, 2500; Nevada, 1000; Riverside, none; San Bernardino, 1200; San Diego, 500; San Joaquin, 1000; San Luis Obispo, 11,000; Santa Clara, 4000; Santa Cruz, 1000; Shasta, 300; Siskiyou, none; Solano, 1000; Stanislaus, none; Sutter, 700; Tehama, 500; Yolo, 500; Yuba, 3000.

7. Can irrigated areas be increased?

Ans. Yes, in all counties but Alameda, Fresno, Lake, Modoc, Mono, Plumas, Solano, Trinity, Tulare, Yolo.

8. Is there sufficient labor for present needs?

Ans. Yes, in Alameda, Calaveras, Contra Costa, Fresno, Kern, Los Angeles, Madera, Mariposa, Mendocino, Merced, Nevada, Orange, Placer, San Benito, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Siskiyou, Stanislaus, Tehama, Trinity, Tulare. Answer no, in all other counties.

9. Number of men required for increased crops?

Butte, 5000; Calaveras, 300; Colusa, 5000; Contra Costa, 6000; Del Norte, 75; Eldorado, 500; Fresno, 500; Glenn, 1500; Humboldt, 225; Imperial, 7500; Inyo, 150; Kern, 3000; Kings, 2500; Lake, 300; Lassen, 14; Los Angeles, 750; Marin, 200; Mendocino, 2500; Merced, 500; Modoc, 500; Mono, 50; Napa, 1000; Nevada, 100; Orange, 700; Placer, 500; Plumas, 700; Sacramento, 10,000; San Bernardino, 1000; San Diego, 1000; San Joaquin, 3000; San Mateo, 2000; Santa Cruz, 300; Siskiyou, 500; Sutter, 1000; Tulare, 5000; Ventura, 4300; Yuba, 750.

11. Is there sufficient local money for financing farmers?

Ans. No, in all counties except Calaveras, Contra Costa, Fresno, Glenn, Merced, Nevada, Sacramento, Stanislaus, and Sutter.

12. Do owners of additional land have capital to crop it?

Ans. Yes, in all counties except Calaveras, Eldorado, Glenn, Imperial, Inyo, Kings, Lassen, Madera, Mariposa, Modoc, Nevada, Sacramento, Santa Cruz, Shasta, Siskiyou, and Stanislaus.

13. Is straw burned.

Ans. Yes, in Alameda, Butte, Colusa, Contra Costa, Eldorado, Glenn, Imperial, Kings, Madera, Modoc, Monterey, Sacramento, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Siskiyou, Stanislaus, Tehama, Tulare, Yuba. Answer no, in all other counties.

14. Is manure conserved?

Ans. Yes, in practically all counties.

15. How do carrying capacities of pastures compare with normal?

Contra Costa, 25 per cent; Kings, 30; Kern, Merced, Nevada, San Joaquin, and Stanislaus, 40; Colusa, Fresno, Lake, Monterey, Napa, Orange, Placer, San Mateo, Santa Clara, Santa Cruz, Shasta, Siskiyou, Sonoma, Tulare, Yolo, Yuba, 50; Butte, Eldorado, Marin, Mariposa, Sacramento, San Joaquin, Sutter, Tuolumne, 60; Amador, Calaveras, Imperial, Mariposa, San Benito, Solano, Trinity, 70; Inyo, Santa Barbara, Ventura, 80; Los Angeles, San Bernardino, 90; Del Norte, Humboldt, Modoc, Plumas, normal.

16. Number of acres of new land which can be profitably plowed for summer fallow?

Alameda, 7500; Amador, 10,000; Butte, 20,000; Calaveras, 250; Fresno, 500,000; Glenn, 20,000; Humboldt, 20; Kings, 50,000; Lassen, 8500; Los Angeles, 4000; Mariposa, 11,000; Modoc, 5000; Monterey, 40,000; Placer, 40,000; Riverside, 30,000; San Bernardino, 5000; Siskiyou, 25,000; Yuba, 5000. All the other counties answered "none."

17. Condition of livestock?

Normal in Alameda, Calaveras, Colusa, Eldorado, Los Angeles, Marin, Madera, Mariposa, Merced, Mono, Orange, Sacramento, San Benito, San Francisco, San Mateo, Santa Barbara, Santa Cruz, Tehama, Tuolumne, Ventura. All the other counties reported condition of livestock to be below normal.

18. Can number of poultry and rabbits be increased?

Ans. Yes, in all counties but Alpine and Trinity, provided increased feed is produced.

19. Can better use of garbage be made by feeding to hogs?

Ans. Yes, in Alameda, Amador, Calaveras, Contra Costa, Glenn, Los Angeles, Placer, San Diego, San Joaquin, San Luis Obispo, San Mateo, Santa Clara, Santa Cruz, Stanislaus, Tehama, and Yolo. All the other counties answered "No."

20. To what extent are local demands for vegetables supplied?

Entirely in Alameda, Los Angeles, Madera, Orange, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Clara, Siskiyou and Trinity. In other counties the following percentages of total need only are pro-

duced: Calaveras, 45; Colusa, 75; Del Norte, 40; Glenn, 10; Imperial, 80; Kern, 60; Kings, 50; Lassen, 35; Marin, 50; Mariposa, 75; Mono, 50; Monterey, 50; Nevada, 20; Placer, 5; Plumas, 60; San Bernardino, 25; San Diego, 85; Santa Barbara, 50; Santa Cruz, 75; Shasta, 10; Solano, 50; Sonoma, 85; Stanislaus, 50; Sutter, 10; Tehama, 75; Tulare, 50; Ventura, 60; Tuolumne, 50; Yolo, 10; Yuba, 10.

21. Can supply of vegetables be increased?
All counties answered "Yes."

22. Do school vacations come at proper period?
Ans. Yes, in Alameda, Amador, Calaveras, Del Norte, Glenn, Humboldt, Inyo, Kern, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Plumas, San Diego, San Mateo, Santa Clara, Santa Cruz, Shasta, Siskiyou, Sonoma, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba. The other counties answered "No."

At 2 P.M. of each day a public mass-meeting was held and speakers presented to the communities the fundamental considerations of the food supply problem in California. Specific recommendations were given for increasing the forage and other crops in each county.

Reports from all the counties visited indicate that the sentiment aroused at these meetings resulted in an increased cropping of land to sorghums and beans. The important rôle the farmer is to play in this war was presented in a way that caused every farmer attending the meetings to feel a sense of personal responsibility to his government. The benefits of such a feeling cannot be measured.

The following table shows the field parties visiting each county and the person or persons who organized the meeting within the county:

County	Hearings conducted by	Meetings arranged by
Alameda	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	M. A. W. Lee, County Farm Advisor
Amador	W. L. Howard W. T. Pope L. S. Smith	E. T. Katok, Forest Supervisor
Butte	H. E. Van Norman C. B. Lipman G. W. Hendry	Earl Mills, Horticultural Commissioner
Calaveras	W. L. Howard W. T. Pope L. S. Smith	R. W. Ayers, Forest Supervisor
Colusa	H. E. Van Norman C. B. Lipman G. W. Hendry	L. R. Boedefeld, Horticultural Commissioner

County	Hearings conducted by	Meetings arranged by
Contra Costa	W. T. Clarke Geo. Robertson B. A. Madson J. W. Nelson	F. T. Swett, Horticultural Commissioner
Del Norte	T. Francis Hunt C. W. Rubel	E. D. Doxsee, District Club Leader
El Dorado	H. E. Van Norman C. B. Lipman G. W. Hendry	J. E. Hassler, Horticultural Commissioner
Fresno	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	F. P. Roullard, Horticultural Commissioner
Glenn	H. E. Van Norman C. B. Lipman G. W. Hendry	W. H. Heileman, County Farm Adviser
Humboldt	T. Francis Hunt C. W. Rubel H. S. Maddox	A. H. Christiansen, County Farm Adviser
Imperial	H. J. Webber	Paul Dougherty, County Farm Adviser
Inyo	V. C. Bryant	E. M. Nordyke, Horticultural Commissioner
Kings	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	Fred K. Howard, Horticultural Commissioner
Kern	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	G. C. Kreutzer, County Farm Adviser
Lake	T. Francis Hunt C. W. Rubel	F. G. Stokes, Horticultural Commissioner
Lassen	G. H. True R. F. Miller	A. H. Taylor, Horticultural Commissioner
Los Angeles	H. J. Webber R. S. Vaile L. D. Batchelor A. D. Shamel W. B. Rowland	William Wood, Horticultural Commissioner
Marin	T. Francis Hunt C. W. Rubel G. H. Hecke	T. P. Redmayne, Horticultural Commissioner
Mariposa	W. L. Howard W. T. Pope L. S. Smith	L. A. Benedict, Forest Supervisor

County	Hearings conducted by	Meetings arranged by
Modoc	G. H. True R. F. Miller	W. G. Durbin, Forest Supervisor
Monterey	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	E. K. Abbott, Horticultural Commissioner
Madera	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	T. C. Mayhew, County Farm Adviser
Mendocino	T. Francis Hunt C. W. Rubel	C. Van Dyke, Horticultural Commissioner
Merced	B. H. Crocheron C. F. Snaw E. C. Voorhies S. P. Frissell	A. E. Beers, Horticultural Commissioner
Napa	T. Francis Hunt C. W. Rubel G. H. Hecke	H. J. Baade, County Farm Adviser
Nevada	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	D. F. Norton, Horticultural Commissioner
Orange	H. J. Webber R. S. Vaile L. D. Batchelor A. D. Shamel W. B. Rowland	Roy Bishop, Horticultural Commissioner
Placer	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	E. O. Amundsen, County Farm Adviser
Plumas	G. H. True R. F. Miller	D. N. Rogers, Forest Supervisor
Riverside	H. J. Webber R. S. Vaile L. D. Batchelor A. D. Shamel W. B. Rowland	H. J. Webber
Sacramento	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	Carl Williams, County Farm Adviser
San Benito	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	L. H. Day, Horticultural Commissioner

County	Hearings conducted by	Meetings arranged by
San Bernardino	H. J. Webber R. S. Vaile L. D. Batchelor A. D. Shamel W. B. Rowland	J. P. Coy, Horticultural Commissioner
San Diego	H. J. Webber	H. A. Weinland, County Farm Adviser
San Francisco	W. T. Clarke B. A. Madson J. W. Nelson	Dudley Moulton, Horticultural Commissioner
San Joaquin	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	R. D. Robertson, County Farm Adviser
San Luis Obispo	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	S. F. Christierson, Horticultural Commissioner
San Mateo	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	Newton Peck, Horticultural Commissioner
Santa Clara	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	Earl L. Morris, Horticultural Commissioner
Santa Barbara	H. J. Webber	C. W. Beers, Horticultural Commissioner
Santa Cruz	W. T. Clarke B. A. Madson J. W. Nelson Geo. Robertson	W. H. Volck, Horticultural Commissioner
Shasta	G. H. True R. F. Miller	G. A. Lamiman, Horticultural Commissioner
Siskiyou	G. H. True R. F. Miller	W. L. Kleaver, Horticultural Commissioner
Stanislaus	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	C. M. Conner, County Farm Adviser
Solano	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	J. W. Mills, County Farm Adviser
Sonoma	T. Francis Hunt C. W. Rubel G. H. Hecke	O. E. Bremner, Horticultural Commissioner

County	Hearings conducted by	Meetings arranged by
Sutter	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	H. P. Stabler, Horticultural Commissioner
Tehama	H. E. Van Norman C. B. Lipman G. W. Hendry	C. B. Weeks, Horticultural Commissioner
Trinity	G. H. True R. F. Miller	W. C. Heustis, Forest Supervisor
Tulare	B. H. Crocheron C. F. Shaw E. C. Voorhies S. P. Frissell	C. F. Collins, Horticultural Commissioner
Tuolumne	W. L. Howard W. T. Pope L. S. Smith	R. W. Ayers, Forest Supervisor
Ventura	H. J. Webber R. S. Vaile L. D. Batchelor A. D. Shamel W. B. Rowland	A. A. Brock, Horticultural Commissioner
Yolo	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	N. P. Searls, County Farm Adviser
Yuba	H. E. Van Norman C. B. Lipman G. W. Hendry H. Weinstock	C. W. Harney, Horticultural Commissioner

OBSERVATIONS ON THE RECENT AGRICULTURAL INQUIRY IN CALIFORNIA*

MADE BY DIRECTION OF THE COMMITTEE ON RESOURCES AND FOOD SUPPLY OF THE STATE COUNCIL OF DEFENSE

By Thomas Forsyth Hunt

There are presented herewith copies of the report of each of the eight parties which conducted and completed an agricultural inquiry in California in the twelve days ending April 27, 1917. A study of the data and recommendations of these committees is essential to a complete presentation of the inquiry. It is intended with your permission to print these summaries together with other special reports and documents in the Annual Report of the College of Agriculture where due acknowledgement will be made of all the agencies and individuals who have so generously assisted in conducting this inquiry and without which its success would have been impossible. For the sake of brevity, I propose to restrict myself to the presentation of certain conclusions that have been impressed upon me not alone by the study of the large mass of data collected, but also by other facts which have come to my attention since making a previous report to this committee.

I shall not be disappointed if you do not adopt the conclusions. I am conscious of the steps through which every nation has gone which prosecutes to a final conclusion a war of the first magnitude. It first exhorts, it next admonishes, it then threatens, and finally it compels. This nation can hardly hope to escape these steps if war continues for three or more years. The best that can be hoped is that the steps may be shortened. It is, however, desirable that you who have placed upon you such grave responsibilities should be able to see to the end of the road.

Acting under your instructions an agricultural inquiry was conducted to determine as far as such an inquiry could determine, the actual condition of crops, and to point out the desirability of raising

* Published May, 1917.

summer forage crops to the end that the output of animal products be maintained. The parties making the inquiry also gave information about the growing of certain crops with which some farmers have not yet had any considerable experience.

As was to be expected, the farmers were everywhere found to be bending all their available capital and energy to the production of farm products. It is worthy of note that the men who conducted these inquiries came back inspired by the cordial support and the patriotic fervor with which the various audiences received them. Nothing in agricultural propaganda with which I have been more or less intimately connected for a third of a century has so impressed me as the enthusiasm with which these men returned from their two weeks' campaign.

It may be safely stated that never has so much capital or so much labor been expended in the production of farm crops in California as during the present season. Broadly speaking, yield of crops depends upon two factors: (1) capital, including labor, and (2) weather conditions. Unfortunately the rainfall has been deficient and temperatures have been rather uniformly below normal during several months. It is necessary to report, therefore, that notwithstanding the strenuous efforts of the farmers the total crop yields of the state will be below normal, although probably not the gross financial returns.

It is difficult to secure the actual facts through an inquiry of the kind conducted or to make a general statement that will apply to the state as a whole. The inquiry was, of course, mainly concerned in determining the yield of crops and in creating a surplus of food for our allies. The men giving testimony can hardly escape being influenced by their economic returns. A producer of prunes may anticipate only 90 per cent of a normal yield, yet if he has them contracted at 25 per cent above the usual price, he is apt to testify his crop is satisfactory, especially when with the anticipated high price for labor he reflects that it costs him less to harvest a 90 per cent crop. In the same county alfalfa under irrigation may be 20 per cent above normal, while barley hay on adjacent unirrigated land may be 50 per cent below normal. To what extent they offset each other is obviously dependent upon the relative acreage. Potatoes may be above normal in most of the counties not raising potatoes extensively but considerably below normal in regions where they are principally grown.

In general, however, field crops, that is crops other than fruits and vegetables are somewhat below normal in the Sacramento Valley, much below normal in the San Joaquin Valley and up to normal

PLANT NOW
GRAIN SORGHUMS

Sorghums will grow in hot, dry districts.
Sorghums are drought resistants.
Sorghums are an excellent substitute for corn.
Grow sorghum for grain and forage.
With irrigation, sorghums may follow grain hay.
Plant sorghums on any good, average soil.
Plant up to May 1.
On irrigated land plant up to June 25.
Prepare seed bed thoroughly with a two-inch mulch.
For grain, plant rows three and one-half feet apart; plants, four to six inches apart, in the rows; six to eight pounds per acre.
For forage, seed heavier than for grain; 30-40 lbs.
Plant seeds below mulch on moist soil.
For grain, plant dwarf milo, Egyptian corn or feterita.
For forage plant Kafirs or sweet sorghums.
Keep down weeds around young plants.
Cultivate to preserve mulch and conserve moisture.

Ask your Farm Adviser, or write the University of California, College of Agriculture, Berkeley

chiefly in counties of relatively small acreage.* Irrigated crops are not so seriously affected in the San Joaquin Valley, but even here reports state that the cold spring has retarded the alfalfa so that one less cutting is generally anticipated. Speaking again in most general terms, the fruit situation from the standpoint of the producer and the fruit handler may aside from the question of labor be stated to be satisfactory. The indications are that fruit is not much below normal in yield, and owing to prevailing prices will bring to the state as much and perhaps more money than usual.

Some difficulty has been experienced by canners in securing tinplate and the wholesale stocks of glass jars were found to be low. A special inquiry was made by our parties which indicate that sufficient stocks of these containers are held by retailers to meet all probable demands. The College of Agriculture has recently published brief succinct instructions on the drying of suitable fruits, especially for those growers who are not accustomed to practice the well known methods of the larger operators.

The acreage of beans will probably be the largest in the history of the state. The acreage of sugar beets has also increased, although seasonal conditions causing some shortage of labor for thinning has in some instances resulted in a substitution of beans for beets. Although difficult to determine, because of properly assessing the relative influence of commercial and amateur planting, it is probable that the effective acreage of potatoes is not quite up to normal. The growing of vegetables on the farm for home consumption needs to be greatly extended in these critical times.

Owing doubtless to satisfactory prices which have prevailed for several years the ranges and native pastures are fully stocked with cattle and sheep. There is every evidence that these pastures will not be able this season to support adequately all the animals available. It is further fully established that reserves of grain, alfalfa and other forage are smaller than in any previous time in several years.

A vigorous campaign has been made to increase production of sorghums for grain and forage, and to increase silos for the preservation of forage sorghums. The proper officials of the Federal Government have been requested to make available for pasture the National parks of the state. The District Forester, Mr. Coert Du Bois, estimates that under forest service regulations approximately 30,000 head of cattle or their equivalent in sheep can thus be saved. It is estimated that there are in California 627,000 head of cattle or

* During the two months following this inquiry, there was, owing to favorable weather, an increase in grain crops amounting to perhaps 10 or 15 per cent.

HOW TO WIN THE FIGHT FOR DEMOCRACY

1. Increase the Army and Navy
2. Build More Ships
3. Increase Food Supplies for our Allies

WHICH ARE YOU DOING

equivalent in sheep which the native pastures can not successfully carry this season. Some will go to market at relatively low prices. If the rest can be held until November, some may be transferred to the valleys to be fed on alfalfa, grain hay, and sorghums including silage, while others may at present prices be shipped to the feed lots of the central west where Indian corn will doubtless be abundant by that time. The final outcome will be somewhat influenced by the time and character of the fall rains. Whether these cattle are fed in the valleys of California or in the feed lots of the central west, without doubt higher prices must be paid for animals on the hoof next year and in the years immediately thereafter than is now being paid.

If meat production is to be materially increased in California, the valleys must take a larger part in the industry than heretofore. This will come about by bringing steers from the ranges at an earlier age to be finished in the valley while breeding cows take their places on the range.

Progress can also be made by reducing the excessive loss of lambs by the use of lambing sheds, thus reducing the number of ewes necessary to carry on the ranges to secure a given crop of lambs. A member of the staff of the Division of Animal Husbandry has been detailed to go among the sheep raisers furnishing plans of a simple lambing shed and if possible bring about better care at this critical period of the shepherd's business. This effort is too late to be beneficial during the present season.

The valleys of California can greatly increase the production of pigs and chickens, but, in order to do so, food, particularly grain sorghums, must be raised. The farmer who undertakes to increase his supply of pigs without first or concurrently growing food for them is destined to disaster.

More of the poultry of California should be raised on the farm which produces the food that they consume. California has the most numerous, large, specialized poultry plants in the United States yet keeps less poultry and produces less eggs per capita than many, perhaps most other states. The reason is that poultry are not so universally raised as a by-product of the farm as elsewhere. Today poultrymen are sacrificing their flocks on account of the high price of feed.

If a farm raises one acre of grain sorghums there can be kept with profit 50 hens which would produce 500 to 600 dozen eggs each year. The seed for this acre costs about 50 cents and even without special machinery the planting can be done in less than half a day by the wife or daughter if necessary. There is perhaps no other part of the United States better adapted to raising poultry than California.

FEED OR FIGHT

1. **RAISE MORE LIVE STOCK**

   It is impossible to overdo this business within the next five years, war or no war.

2. **WINTER FEED STEERS**

   Substitute cows on the ranges for steers over two years of age wherever practicable.

3. **SAVE LAMBS**

   Build lambing sheds to eliminate the excessive loss of new-born lambs. The U. C. College of Agriculture will furnish plans.

4. **INCREASE FARM FLOCKS**

   Keep small flocks of sheep on farms to conserve forage not otherwise utilized.

5. **DOUBLE PORK OUTPUT**

   Keep two brood sows instead of one wherever grain sorghums are available.

6. **SAVE DAIRY CALVES**

   Skim milk is a food. Dairy calves should not be sacrificed prematurely.

7. **GUARD AGAINST DISEASE**

   Report any outbreak of disease among domestic animals immediately to Dr Chas. Keane, State Veterinarian, Sacramento, Cal.

8. **SILOS CONSERVE FEED**

   Build silos for the storage of non-saccharine sorghums, sweet sorghums or Indian corn. The U. C. College of Agriculture will furnish plans and supervise without expense, the building of silos by community effort. The materials cost about $1.50 per ton capacity.

Ask your Farm Adviser, Forest Ranger, Horticultural Commissioner, or write to the **University of California, College of Agriculture, Berkeley, Cal.**

The lack of poultry production except as a specialized and commercialized industry is due, doubtless, to the Californians' traditional dislike for small things.

Upon the important subject of fish, which your committee directed a report to be made, the investigations indicate that the supply can readily be increased to meet any reasonable demands. Doubling the supply of fresh fish is merely a matter of increasing the nets. I hesitate with my rather limited knowledge of the situation to offer concrete suggestions, but I am convinced that with further study it would be possible to increase consumption of fish without increasing the price to the consumer. By proper co-operation the consumers' prices may even be lowered. Here, as in many other cases, high prices paid are the fault of the habits and exactions of the consumer and can be remedied only by his assistance. At any time and particularly at this time, an abundant and wholesome supply of fish is an important asset to any community.

The most frequent statement found by examining the detailed reports on horses and mules is "supply about equal to present needs." Several counties report horses for sale, one county reporting some horses for sale because of the high price of feed. Independent investigations of horses available for the army are less optimistic. It is generally conceded that relatively few horses meet the cavalry requirements. It is also certain that there can be no considerable extension of the present cultivated area, nor more intensive cultivation of areas at present under cultivation without more power.

While in a military sense this country has been engaged in war but a brief period, if at all, yet from the standpoint of the labor and food supply the United States has been in this war since August, 1914. It is not strange, therefore, that the agricultural inquiry should develop the farm labor situation to be one of the high lights. Our entrance into the war as a military aid to the Allies will serve to intensify the situation somewhat, the extent to which this will occur being dependent upon the methods of taxation adopted to meet the war loans. It was reported to our inquirers that in one-half of the counties the labor supply was sufficient to meet present needs, while three-fourths of the counties reported they did not expect to be able to secure sufficient labor within the country to meet the peak load.

In considering the labor situation it is necessary to recognize that a belief in a shortage of labor is a chronic state of mind on the part of many producers. I began employing and superintending farm labor thirty-six years ago and I have been at it almost constantly ever since. During that time there has never been a year that farmers of

a certain type have not complained about the shortage, or the high price of labor. All this has occurred in the face of the fact that most farmers are benefitted by the high price of labor, for most farmers labor with their own hands. In some cases most sensational statements have been made to our parties apparently with ulterior motives. These statements when investigated by men especially detailed for the purpose have been shown to be either grossly exaggerated or without any foundation in fact. However, after discounting this hereditary state of mind and the sensationalist who wishes to take advantage of his country's condition in the interest of his personal ends, there still remains an acute farm labor situation.

A member of one of our survey parties returned with this concise statement:

"The big fellow wants labor, the little fellow wants capital." This statement was based upon observation and not on any theoretical consideration whatsoever. Nevertheless, the fact is based upon the soundest economic laws and represents an age-long controversy. It is to the economic interest of the large property holder, who employs labor to do his work to have the rate of interest high and labor cheap. His economic interest is not served by rural credits. On the other hand, the renter, or the man with a small equity in his land who daily toils with his own hands has his economic status promoted by cheap money and dear labor.

Finding the situation as it is, the problem was attacked in three directions.

1. A farm to farm post-card canvass of the actual labor needs was begun, every farmer being asked to give the essential data concerning his individual needs. The following is a sample inquiry:

The ——— County Farm Bureau is compiling a labor directory. We would therefore like to know whether you will need help on your ranch this year—more than you can supply yourself. If so, please fill in the attached postal and mail. We will make a summary of the returns and assist you to secure help when you need it. Don't delay, but mail the postal at your earliest convenience.

(Return Card) .....Cal.,

.....1917.

I will need.....men and.....women and.....children during the period of.....days in the months of.....to help in..... (picking prunes, etc.)

I will provide:	I will pay:
Board and room.....	Per box .....
Camping grounds	Per ton .....
House	Per day .....
Water	Per month .....
Sanitary conveniences	

(Name).....

Such a canvass is now being conducted in seventeen counties and will be rapidly extended throughout the state provided the results obtained in the seventeen counties justify such action.

2. Consideration has been given to the best methods of making a house to house canvass in all the large cities in order to develop the supply of labor which can actually be made available for farmers. Consultation with men of experience in handling the labor problem in the cities seems to indicate that this can be done more readily than was at first supposed possible. Your committee already has such voluntary offers as make it seem probable that this task, stupendous as it may at first seem to be, can be accomplished within two weeks whenever it is desirable to do it. Of course it could not be done except under the stress of the patriotic motive. It has not been deemed expedient to have this canvass made until more definite information concerning the character and extent of the farm labor and the time when needed have been obtained. Further, the work can be more effectively accomplished after the registration for enlistment has been completed.

3. A plan is being developed to make the largest possible use of the 47,000 high school boys of California. Before a state of war was declared, the College of Agriculture in co-operation with the U. S. Department of Agriculture and fifteen high school teachers had approximately 2000 high school and elementary boys growing crops in club contests.

The second week in April the college called upon these boys to grow additional crops and to volunteer their services in spreading agricultural propaganda and in otherwise assisting local agricultural officials. The response was so marked that on April 30 eight members of the staff of the College of Agriculture began a canvass in the high schools outside the large cities in an attempt to induce the 20,000 boys so situated to grow crops. The next step was to outline a plan by which the remaining available boys might be mobilized to help in the coming harvest. The plan was first informally outlined at a meeting of the members of the State and County Councils of Defense in San Francisco, Thursday, May 3, and unanimously endorsed.

It is not to be understood as a method of solving the whole farm labor problem, but only a certain important phase of it. It may also be pointed out that this is the only large question connected with increasing the food supply, and hence, with the prosecution of the war, that is not primarily a federal matter. The Federal Government has no jurisdiction over the state school system at present, and will have only an indirect one after July 1. In all other matters

PROFIT OR LOSS

The University of California Department of Economics says: "There are two reasons for the vast increase in prices.

1st. The increase in money in circulation, including credit instruments.

2nd. Actual scarcity of food and an abnormal demand. War or no war, food prices generally will not fall in the next two years because:

1st. The money in circulation cannot be called in.

2nd. The abnormal war demand will absorb all possible increase in supply.

3rd. Hold-over stocks of primary foods have been consumed. This increases all other food prices.

The crops of wheat, barley and oats in the United States in 1915 were the largest in our history, yet prices were the highest since the Civil War."

DO NOT BE AFRAID OF OVER-PRODUCTION

the state at best can act only in an advisory capacity. In the very nature of the case, as the war progresses, these state activities will become more and more inconsequential.

The important question is to secure appropriate action providing for the employment by the several boards of education of such teachers as may be needed. The State Board of Education may possibly be able to supplement this action by the use of Smith-Hughes funds amounting to about $20,000. If it has any question about the legal use of the funds it can easily have the national and state officers pass upon the question, i.e., P. H. Claxton, Commissioner of Education, Washington, D. C., and Wm. D. Stephens, Governor of California.

According to the Superintendent of Public Instruction there are 47,000 young men in the high schools of California. Not all of these will be available for employment on farms, because—(1) some will work at home; (2) others will work at other occupations; (3) some may not work at all. However desirable it may be to have these young men also supervised, it can hardly be said to be necessary for the purpose of meeting the present emergency.

When the employment of teachers is settled, then the method of placing and supervising the young men will need to be worked out by the State Council of Defense through its Committee on Resources and Food Supply. In some cases, particularly in the larger cities, the high school students will be taken to distant places to work in groups of ten or more. They will generally live in camps and have a common mess. When necessary, it will be the duty of the teacher to mobilize the required materials, to organize the camp, to make contracts with employers concerning pay, to determine that the boys are given only reasonable tasks to do, and to look after the welfare of the young men, especially during the unemployed hours. It is not to be the duty of the teacher to take the place of the employer in seeing that the work is properly done.

In other cases, particularly in the smaller towns, it will be necessary to scatter the students about one, two, or three in a place. In these cases it will be the duty of the teacher to make the arrangements concerning pay, to determine that the rooming and boarding accommodations are adequate, and to visit the farm periodically to determine whether the arrangement is satisfactory to both parties.

It is to be kept in mind that if the war continues for three years or more, many of these young men will become liable for draft. The important question, therefore, is not the amount of money earned or saved, but it is the physical condition in which these young men return to their homes and their school duties. Hence it is proposed that plans shall be developed to prevent overwork. For illustration, if a rancher needs eight men working ten hours a day, he would be furnished with ten men who would work only eight hours a day. If he paid $2.00 a day for ten hours work, each young man working eight hours a day would receive $1.60 per day. If $2.50 was the ten hour rate, then the eight hour rate would be $2.00. It is believed that these young men working eight hours a day would soon be able to render as effective service per hour as the usual farm laborer who works ten or eleven hours.

It is not the purpose of this plan to lower the price of farm labor, but rather to furnish additional labor at the time most needed, at reasonable prices and under proper living conditions, in order that the state may have a body of virile, well-trained young men. It is believed, therefore, that these young men should not be made available below a certain minimum wage, whether the pay is to

be by the hour or by the piece. These young men should not be placed, either in groups or singly on farms, until the supervising teacher has determined that a reasonable wage can be earned by working eight hours, and this wage should not be less than four-fifths of the amount earned by farm labor working ten to eleven hours per day.

Everyone knows where the high schools of his community are, so that in so far as any county is concerned, the ability to supply the labor which high school men are able to perform, should not be difficult. There should be no difficulty in employers making their wants known. However, when it becomes necessary to move men from the large cities to adjacent or distant counties, a clearing house will be necessary. This task the State Council of Defense will undertake, through its Committee on Resources and Food Supply.

This plan was fully discussed at a conference between this committee and members and representatives of the State Board of Education on Monday, May 7, and was formally presented for action at the meeting of the Board of Education on Monday, May 14. On Wednesday, May 9, a group of twenty-four Berkeley High School boys went to one of the islands of the Delta to cut asparagus, in charge of a teacher of the Berkeley schools, who is paid his salary and expenses by the Board of Education. To make this initial experiment, Mr. W. B. Meek not only agreed to raise the price paid for cutting asparagus, but voluntarily organized suitable living conditions under the direction of the State Immigration and Housing Commission, which has been co-operating with your committee in the most vigorous fashion. It is reported that large numbers of boys have gone out from the high schools of the state, notably in southern California, to help cultivate or harvest crops.

Every man, woman and child on whatever pretext, who goes into the open country this summer, will help to relieve the food situation (1) by reducing the cost of transferring food from the country to the city; (2) by living on simpler fare, and (3) by consuming supplies which while perfectly wholesome and palatable, never find their way to the cities for purely economic reasons. If foreign labor is brought to this country, the mouths to be fed will be increased, but if the city population is transferred to the country a saving of food will result.

Although your committee has hardly touched the edge of this problem, it is evident it is going to be one that will require much patience and many readjustments. Even before war was declared $2.50 for an eight-hour day without board had become the customary wage for ordinary manual labor in all the larger cities of California. Farmers who employ considerable groups of laborers complain not

without reason that their industry has not been organized on that basis, since they have had access to labor which did not find steady employment in the cities at that wage. Whether unfortunately or fortunately this class of laborers has since August, 1914, been gradually absorbed into the industrial activities of the nation and is no longer available for farm work at the old rate of wages.

The extra labor which the farmer will employ this summer and probably for several summers hereafter must be largely from those who have come to look upon $2.50 for an eight-hour day without board as a minimum wage. Just what is the equivalent of this wage in the open country it is difficult to state dogmatically, but it is safe to assert that the farmer will find it necessary to organize his business on a higher wage basis than at any time within the memory of most men now living. In trying to organize farm labor primarily to aid in winning this war, the writer has not been unmindful of the interests of the farmers themselves. He, however, finds the solution hopeless unless they will meet the situation at least half way both by offering increased wages, and what is equally important, better living conditions than have obtained in the past in some instances. This means without doubt that the farmer must get more for his crops than ever before. He will not continue and he cannot continue to employ labor at greatly increased prices without a somewhat corresponding increase in his products. The man who is raising crops with his own hands and the help of his family is in quite another category.

The plans just outlined are being carried out with every possible dispatch not because it is believed they will be sufficient to meet permanently the farm labor situation, but because they are the methods which it seems possible to put into practice at the moment. The farm labor problem can not be considered apart from the rest of the activities of the nation. Without doubt, if the war continues for three or more years, radical measures will be necessary. Many of the activities now conducted by able bodied men between the ages of eighteen and forty-five will either have to be eliminated or be conducted by boys under eighteen, or men over forty-five, or by women.

While certain indulgences necessarily must be curtailed, the experiences of the present war teach that it is not safe to limit unduly the opportunities for recreation nor to fail to recognize the value of modern labor conditions. Our allies have found that music and art have human values that may not be omitted in war times. Nevertheless there are some things that can be done with perfect safety. Men can run their own automobiles and women can for the most part do their own shopping. Both men and women can economize on dress.

It is not necessary for any man between the ages of eighteen and forty-five to clerk in a retail store or wait on the table in any club, hotel, or restaurant. Furthermore, in any real war it is not done, as the English would say.

Every effort should be made to reduce the cost of retail delivery. Hence buying in large quantities, popularly referred to as hoarding food supplies, is to be commended. While the transition is taking place between the old process of microscopic telephone purchases and that of the personally selected wholesale purchases there will be, as in all other trade changes, certain derangements and hardships and if after the first spasm of fear or of righteousness as the case may be, is passed, the purchaser falls back into the old method then nothing but harm can come from it, but as a permanent system the so-called hoarding of food supplies which is nothing more than wholesale or original package purchases is to be fostered by every possible means, because it reduces the cost of retailing, which is approximately one-third of the consumer's dollar.

Everywhere our parties have gone the farmers have shown an undoubted patriotism. The following extract is submitted from a letter which was received from a farmer who attended one of our hearings.

"Speaking on the subject of patriotism, the present price of wheat is $3.85 per hundred, which is *too much*. I am willing to sell my crop for $2.50 per hundred, provided a large number of farmers will do the same. My crop will aggregate 4000 sacks, I believe, and I will give 10 per cent of it and roll it to market at my own expense and send it to the cities of the state to be given to the families who are or will be without food.

I will further state that if there is no patriotic movement of this sort I will sell my crop on the market and whatever it brings over $2.00 I will put it in a fund to buy other food products for the families who have no food."

Nevertheless, our parties could not help sense the undercurrent of fear concerning overproduction and the feeling in the minds of the listeners that our advocacy of a given crop or crops made overproduction just that much more certain. To offset this attitude a placard has been widely distributed entitled "How to win the fight for democracy," which aimed perhaps unnecessarily to indicate what alternatives were before the citizen who wished to do his "bit." A placard prepared by the University of California Department of Economics entitled "Profit or Loss" is being distributed in which it is asserted that "War or no war, prices will not generally fall within two years." This was done in an attempt to increase production in order that there may be a surplus of food for our allies. Along comes this unfortunate agitation for the control of food prices. It is barely

conceivable that some person may work out a satisfactory plan, but the present discussion which means a thousand different things to seven million different farmers only causes the farmer to hesitate to extend his operations.

It is not true that the primary necessity is control of food prices. The primary necessity is a surplus of food for our allies. Such methods must be evolved and such sacrifices must be invoked as will produce this surplus. What shall it profit the United States if it reduces the price of wheat and thereby loses this war?

In order to make this situation clear I permit myself the following primer-like cross-examination:

The average farm-owning farmer is perhaps not going to be much affected by this discussion. He has his capital, his machinery, his animals, and the labor of his own hands. He is going to follow his usual course of doing the best he can with these agencies. If prices are not too low and labor not too high, he may perhaps extend his operations somewhat, but for the most part he is going his way through wind and weather feeding the nation in about the usual manner. He cannot be expected to do much more than he always does, because he generally does all he can, the assertion of unthinking people to the contrary notwithstanding. How then is increased production to be obtained in California? I presented at our hearing in San Francisco the situation as it appeared at that time, from which I quote in part as follows:

> What has a great city to do with the production of foodstuffs for our allies? The answer is that if anything more is done than is already being done, it must be by the people of the cities, primarily by those of the large cities. Most people think that the raising of a surplus of food products is a rural problem. It is not. It is an urban problem.
>
> Every farmer is now working at top speed. He is using every dollar of capital and every ounce of muscle he possesses. The farmers are anxious and willing to help, but without the aid of the cities they are powerless to do more.
>
> There are about one-quarter of a million persons in California engaged in agriculture and allied industries. There are approximately one million in other gainful occupations. In the United States as a whole of every three persons in gainful occupations one is engaged in agriculture; in California the ratio is one to five. This is no time to discuss reasons. Suffice it to say that assuming a three years' war, one-quarter of a million people now in the cities of California will be needed to win this war. Fifty thousand will be required for the army and navy and for ship building, and 200,000 will be required on the farms. Twenty thousand are needed at this moment in the open country.

Our inquiry shows that there are considerable areas of land now available for irrigation and water ready to be applied which is awaiting new capital and additional men to make them productive. In

Why all the agitation concerning food?

IN ORDER TO FURNISH A SURPLUS FOR OUR ALLIES.

How can a surplus be obtained?

BY INCREASING THE PRODUCTION OF FARM PRODUCTS.
BY DECREASING CONSUMPTION AND ELIMINATING WASTE.

What is the most effective means of increasing production?

INCREASE IN THE PRICE OF FARM PRODUCTS.

What is the most effective means of decreasing consumption and eliminating waste?

INCREASE IN THE PRICE OF FOOD STUFFS.

What is the objection to agitation for the control of food prices?

IT CAUSES THE PRODUCER TO HESITATE.
IT MAKES THE CONSUMER INDIFFERENT.

When will the price of food stuffs ease off?

WHEN OUR ALLIES HAVE AN ABUNDANCE OF FOOD.

Is the sacrifice too great?

IT IS SMALL COMPARED WITH THE SACRIFICE THAT IS MADE BY THE SOLDIERS WHO HOLD THE FIRST LINE OF TRENCHES.

co-operation with the State Engineer a conference was held on Tuesday, April 17, with a considerable number of water companies and later correspondence was conducted with others. On Friday, April 20, a conference was had with the State Railroad Commission and the State Water Commission with the result that the State Railroad Commission issued an order that during the period of the war water could be furnished at less than usual rates or free of charge without permanently dedicating the use of the water to the land. Through the efforts of the State Water Commission suitable legislation was enacted giving mutual water companies similar powers. It is estimated that approximately 200,000 acres of land will be brought under irrigation for the first time in 1917 which is above the normal increase and water for 500,000 additional acres will be available next year. In California it requires, normally, 25,000 men to cultivate half a million acres of land. For each person engaged in agriculture in the state in 1910 there were invested in land, tools and animals $7000. How can men in the cities be found who will use their capital or their labor as long as a threatened food control whose significance is unknown hangs over them? If this were the proper time to experiment with untried economic theories, however good they may be in themselves, it would not matter, but the necessity of the hour is a surplus of food for the allies. If the State Council of Defense can do anything to clear up this situation immediately it is not too strong to say that it will be doing a lasting service to mankind.

In response to the appeal for more power on farms made at the San Francisco hearing a Committee on Tractors was appointed by Mr. C. H. Bentley of your committee, with Mr. Adolf Mack of San Francisco as chairman. This committee has been actively engaged in considering the feasibility of mobilizing existing tractors and in discussing methods for increasing the manufacture of new ones. There is especial need of a plan to increase the number of effective hours per year per tractor. A system of tractor garages, where a number of machines would be kept, might be developed so that a farmer who may need a tractor not more than one, two or three days in a year may order his work done either by the day or acre. This would result not only in more land being plowed, but also in that the plowing would be more efficiently done. There are in California 100,000,000 acres of land of which approximately 5 per cent was under the plow in 1910.

If I do not misjudge the temper of the people they are ready to contribute rather freely to any humane or charitable enterprise which is the outgrowth of the present conflict. The response is particularly hearty when the aim is to relieve suffering. "Save your money for

the Red Cross" is the common and often jocular expression which represents this wholly commendable attitude. On the other hand, there seems to be a settled conviction that anything that has to do with the prosecution of this war is a governmental enterprise and should be a direct tax on the people at large. I am not commenting upon the propriety of this point of view, but I call the attention of the committee to the reality with which it must deal if its efforts are to become effective.

One of the chief items which on April 10 your committee asked that consideration be given was the conservation of food and the elimination of waste. The machinery for this task was created by the appointment of a committee of dietitians and others with a member of your committee, Miss Ethel Moore, as chairman. A memorandum entitled "Seven ways in which money is wasted and how to save this waste" was immediately prepared and sent to 225 teachers of home economics in the state and widely circulated in the press. It was also placed in the hands of the president of the State Federation of Women's Clubs. A strenuous effort is being made to enlist this organization, with a membership of 40,000, as well as other women's organizations, in promoting the practice of economies. The subcommittee is preparing and distributing a list of menus, tracts on drying and otherwise preserving fruits and vegetables, and on the rearing of poultry. It is now fully established that the winter wheat crop of the United States will be below normal, probably so much below normal as to make it impossible for a bumper spring wheat crop to offset the winter wheat shortage. When the demands of our allies are taken into consideration there is every reason to believe that high prices for wheat must continue to prevail. The public should not be lulled into feeling that by some legerdemain they are going to secure cheap food in the near future.

There is every reason to believe that this country will have an abundant corn and oat crop. Fortunately, they are both admirably adapted to human consumption. Without doubt the supply of corn will be four times as great, and that of oats as great as the wheat required for home consumption. Notwithstanding the fact that the Indian corn crop of last year was the smallest in several years, there is in sight at this moment corn enough to furnish food for our population for a whole year if there were not a pound of wheat in existence. It is, of course, not desirable that wholesale substitution of corn and oats for wheat should be made, because the meat supply would thereby be curtailed. Nevertheless the consumer should be taught that the proper course is to cut down meat bills and to substitute for wheat,

so far as practicable, corn, oats, rice, and barley. So far as the adult population is concerned this would probably result in a general increase in health. There is need of care, however, in making radical changes in the dietary of growing children, who are in special need of the kind of protein furnished by meat, milk, and eggs.

An investigation of the garbage of one city in California made by Dr. C. M. Haring of the College of Agriculture shows that if this garbage were fed to pigs, the pork produced would be equivalent to 1 per cent of the total food consumption of that city. Probably the most practical method for the householder to deal with this waste is to keep from three to six hens. Care should be taken not to keep too many fowls, because if the waste product becomes too small a proportion of the food consumed by them, they may no longer be economical. The College of Agriculture is publishing a circular on city poultry-raising, with plans for suitable quarters for a small number of fowls.

Belgian hare furnish a wholly nutritious and healthful source of meat. They, however, do not consume waste products, being best grown on a diet of dry alfalfa and barley meal.

It gives me pleasure to report that the probable allotment of funds from the Secretary of Agriculture for the further extension of the County Farm Bureau system will make it possible to serve you more efficiently in the future. Both the present facilities and these added ones are at your disposal subject to the approval of the President and the Regents of the University, which I am sure may be assumed.

CONCLUSIONS

I have therefore in conclusion to report to your committee that the tasks that lie immediately before it seem to be as follows:

To bring the labor resources of the cities in touch with the labor needs of the country by a family to family convass of both city and country and to act as a clearing house for this information.

To organize tractor garages or similar methods of giving the farmers more power.

To urge city capital and city people to engage in the production of food in the open country, particularly on those lands on which water has recently been made available.

To further promote plans of meeting the livestock situation and to promote a larger use of the abundant supply of fish which can readily be increased.

To furnish organizations of women with information concerning the conservation of food and the elimination of waste and to impress upon them the great possibility of state and local associations in promoting economy in food and clothing and in eliminating such indulgences as are not strictly necessary to the best welfare.

To assure the producer that whatever food control may mean that prices of food products can not appreciably decrease in the next two years, and to warn the consumer that the sooner he adjusts himself to the present or higher scale of prices, the better it will be for him and for the cause for which this country is fighting.

And now finally, the pity of it all is that very little attention will be paid to most of these recommendations. There will be in the hands of the American public during the next two or three years more money and instruments of credit per capita than there ever were in any nation of the world, and there is every reason to believe that this country is to witness the most prosperous times and the most riotous living that it has ever known. In the meantime it is our allies who will suffer.

> For what shall it profit a man if he shall gain the whole world and lose his own soul?

DEL NORTE
SISKIYOU
MODOC
8
HUMBOLDT
SHASTA
LASSEN
TRINITY
TEHAMA
PLUMAS
MEN-
GLENN
BUTTE
SIERRA
6
7
NEVADA
COLUSA
SUTTER
YUBA
LAKE
PLACER
YOLO
EL DORADO
SONOMA
NAPA
AMADOR
ALPINE
SOLANO
5
CALAVERAS
MARIN
CONTRA COSTA
SAN FRANCISCO
ALAMEDA
SAN JOAQUIN
TUOLUMNE
MONO
STANISLAUS
MARIPOSA
SANTA CLARA
MERCED
MADERA
4
SAN MATEO
SAN BENITO
FRESNO
INYO
2
MONTEREY
TULARE
3
KINGS
SAN LUIS OBISPO
KERN
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
1
ORANGE
RIVERSIDE
Colorado River
SAN DIEGO
IMPERIAL

SUMMARY OF THE REPORTS OF FIELD PARTIES CONDUCTING AGRICULTURAL INQUIRY, APRIL 16–27, 1917

1. SOUTHERN CALIFORNIA

By L. D. Batchelor

Crop Conditions.—Citrus crops are normal or above in practically all counties. A total tonnage of 110 per cent of normal seems likely. Deciduous fruits are normal or above in all counties except Riverside and Orange, where the late frosts did some damage to the stone fruits. A walnut crop of 115 per cent of normal is anticipated. There has been an increased planting to beans in all counties except Santa Barbara, where this crop is already very important. A total tonnage of from 125 to 150 per cent of normal is indicated. A normal crop of beets is expected. Threshed grain is below normal on the dry-land areas, but equal to normal on the vast irrigated areas of Imperial County. The milo planting is above normal, mainly in Imperial County, where 100 per cent above the usual crop is expected. The potato area has been increased to a considerable extent in Santa Barbara, Riverside, and San Diego Counties. The total crop of the entire area will apparently approach 150 per cent of normal. Fresh vegetables for commercial purposes are apparently normal, but there is a marked increase in the number of home vegetable gardens. There has been considerable increase in the cotton acreage in both the Palo Verde and the Imperial Valleys; 150 per cent of the normal crop is anticipated.

Grain-hay will apparently fall from 30 to 40 per cent below the normal production. The carrying capacity of pastures is below normal in most instances, approaching 75 to 80 per cent of the usual amount. The alfalfa crop will apparently be below normal, as the acreage in Imperial County has been reduced to plant cotton and the cold, backward spring has reduced the tonnage throughout the entire area.

Intercropping.—This practice is normally well established in the coastal sections, where the bean crop has proved to be a reliable and profitable crop to grow between trees. The interior regions do not normally intercrop the orchard, due to lack of initiative, water shortage, or lack of adaptation of soil and climatic conditions to profitable crops. It will be possible to increase the intercropped areas of orchard land in Southern California by from 40,000 to 50,000 acres. This land naturally is already well cultivated and irrigated, and often includes the best agricultural property of the various sections. Much of the inland section will be planted to beans during the current year, as all indications point to a profitable disposal of that crop. Beans are by all means the most popular and apparently the most profitable intercrop for an orchard, winter cabbages or early potatoes coming second. There is a feeling that corn or grain sorghum may be harmful to the young trees as well as being less profitable than beans.

There will be need of competent advice on bean culture in those sections where this crop is being grown for the first time this year.

Double Cropping.—This system can be profitably practiced in the warmer inland sections, where such a crop as milo may follow cantaloupes, barley, or any of the early vegetable crops. The coastal areas are less promising for a practical form of double cropping. Here the opinions are very strong that double cropping means two poor crops rather than one good one. The cool weather shortens the growing season in that area, while an abundant amount of irrigation water after a certain seasonable period serves only to cool the soil and retard growth rather than hasten it. The greatest area which will be double-cropped during this season and the one which gives greatest promise for this practice, is Imperial County, where there will apparently be a 100 per cent increase in acreage of milo planted, estimated at 100,000 acres, largely on land which has already produced one crop. Tepary beans might follow as a second crop after cantaloupes.

It has been suggested that early fall barley might well be planted in September and October between the rows of short-staple cotton and provide 50,000 acres of pasture for a short period. There is an anticipated shortage of forage for feeders in Imperial Valley next fall, due to much land being given over to cotton and milo.

Extension of Irrigated Areas.—The irrigated land could be greatly increased by the enlargement of irrigation systems already established; these areas, amounting to a total of 100,000 acres, more or less, which might be irrigated in 1918. Probably the most notable areas are: first, the San Joaquin ranch, at Tustin, Orange County, where there are 25,000 acres of land now being dry-farmed, which could be watered from wells already in existence, by merely extending distributing pipes; second, from 10,000 to 40,000 acres in Imperial County, water for which could be obtained in 1917 by a temporary weir in the Colorado River (after the current season the extra water will be obtained by a new and permanent "in-take" now under construction; however, if the farmers were assured of this late water which the weir would furnish, they could greatly increase their milo acreage this season); third, 15,000 acres in the San Fernando Valley, which could be brought under irrigation by the extension of distributing service. The practicability of developing these several projects may vary widely.

Surplus Water.—This will bring about an increased production during the current year by making use of extra water now held by private water companies and individuals. The recent action of the state legislature in passing an emergency water bill will make this greater production possible.

Labor.—There is a general shortage of labor throughout most of the district covered. At present this shortage is more acute in Imperial, Los Angeles, Riverside, and Ventura Counties, and unless some unusual steps are taken, will probably be more acute at harvest time. A general shortage in the back country of all counties seems more acute than in the country surrounding the larger towns and cities. The greatest shortage during the spring and early summer months will be felt in connection with the beet thinning in Ventura and Los Angeles Counties; the apricot harvest in Ventura County; cotton chopping, cantaloupe, grain, and alfalfa harvest, and milo planting in Imperial County. The shortage of labor for beet thinning is not due to a smaller number of laborers than usual, but rather to the fact that the growth of early beets

has been retarded by cool weather, and therefore both early and late beets will need thinning at the same time. More men are in the beet fields than normally.

The most acute shortage will apparently come from September 15th to November 15th, and especially during October, when practically all the counties of southern California, excepting Imperial, will be harvesting one or more of the following crops: beets, beans, walnuts, apples, and grapes. There is an estimated shortage of from 7000 to 8000 laborers during the period of September 1st to November 15th for the crops mentioned. Furthermore, the cotton and milo harvest will begin in Imperial Valley and Palo Verde Valley before the above crops are fully harvested in the more northern sections. The Imperial Valley shortage is estimated at the present time as approximately 4500 men to work on the cotton and milo harvest from October 15th to January 30th. If it were possible to take care of the shortage on the coastal areas so as to hasten the harvesting of beets, beans, and walnuts as early as under normal conditions, or possibly even earlier, it might be practicable to move the necessary 4500 laborers to Imperial Valley for the cotton and milo. The large percentage of this labor must be done by men, especially on the beets and beans. However, women and children can be used very efficiently in harvesting walnuts, apples, and cotton. The suggestion was frequently made that the total county or local labor requirements could be reduced if the various agriculture interests would establish a clearing-house for labor. A plan might be thus arranged whereby each interest could handle a considerable number of men during their peak load, and an attempt be made to house properly and to employ such labor throughout the entire year. The evils of depending periodically upon migratory labor are especially emphasized in Imperial County.

The abnormal migration of Mexican laborers from one section to another during the current season has been due apparently to a high and fluctuating labor wage. The probable return of any amount of this labor to Mexico seems unlikely. Steps should be taken to gain the confidence of the Mexican laborer.

Recommendations have been made that industries which are employing men and energy in a manner not constructive to the welfare of the nation should be temporarily eliminated. Large amounts of labor and produce could be appropriated from the liquor business, thus raising the efficiency of thousands of men.

City improvement might well be delayed until after the war crisis.

The shortage of labor in Imperial County might be materially reduced if more favorable railroad rates were established to transport migratory labor in and out of the valley.

Machinery, Tools, and Work Stock.—There is apparently no abnormal condition in farm machinery and work stock in this region as a whole. No shortage is anticipated, with the possible exception of a lack of sufficient bean-harvesting machinery in San Bernardino County, where the acreage of beans has been increased about 700 per cent.

The point is further brought out, however, that the use of tractors in leveling and preparing land in some of the newer sections, as in the Palo Verde Valley, is a much more economical procedure than by the use of horses or mules. The tractors conserve both man power and capital, as well as time. None of the sections visited felt that there was any appreciable surplus of farm work stock.

Capital.—There seems to be a wide variety of conditions existing surrounding the availability of capital for farming operations. In Santa Barbara, Ventura, Orange, and Los Angeles Counties there is little or no complaint on the

part of the farmer. On the other hand, the so-called back country, as Antelope Valley, Los Angeles County, and parts of San Diego County, as well as Imperial Valley in general, feel that money is not always available to finance farm operations; that is, on such terms as it is practicable for the farmer to meet. Crop mortgages are not sought after by the bankers of Imperial Valley this year, and in fact such mortgages will seldom be made until a crop is well started; in case of the cotton, for example, not until after it is chopped and there is indication of a normal harvest. Apparently the farm tenants and newcomers in most of the sections have difficulty in obtaining sufficient capital under the present banking conditions.

Seed.—There is no general shortage of the common farm and garden seeds for the current season. However, the supply of beans, onion sets, and sweet potatoes are short in certain sections. There will likely be an abnormally small carry-over for 1918. This especially is true of the crops which have been planted in unusual amounts this year.

The selection of high-grade seed may be the most economic means of increasing the production of our various annual crops. It seems important that steps be taken to provide the best possible grade of seed for the 1918 planting. The location of blocks of especially pure and desirable strains of the several crops might well be undertaken by the government agencies. If a pure strain of milo were planted, it would be possible to harvest it by machinery; whereas the present uneven growth due to mixed seed makes hand-picking necessary.

The proper storage of such seed and its sale to the farmers in 1918 at only a reasonable profit might well be assured.

Land for Summer Fallow.—Dry-farm land which might be summer-fallowed amounts to 11,000 acres, more or less; some of this land has not proved profitable during normal years of the past. The whole question of the increase in acreage of improved farm land during the period of the war may be debatable, as it is increased production rather than increased acreage that is being sought. With the shortage of farm labor and the time which is involved in bringing these areas under cultivation, the question might well be asked, cannot a greater tonnage be produced by a more intensive agriculture on land already cultivated?

Live Stock.—The condition of all cattle is apparently normal, with the exception of Los Angeles County, where their condition is considered to be slightly below average.

Dairy cattle are apparently normal (as to condition and number) throughout southern California, except in San Diego County, where the milch cows are increasing in number.

The number of beef cattle in the entire district is apparently normal with the exception of Imperial Valley, where the number of feeders is estimated to be only 75 per cent of normal.

Milch goats are becoming more prevalent in this area; animals are in good demand and the supply seems to be short.

A general decrease in the poultry population of the area seems very probable, due to the high cost of feed. In only two sections was there any apparent anticipation of increasing the poultry, namely, in Imperial Valley and Orange County. In the Imperial region, where there is a marked increase in milo planting, there is thought to be a 50 per cent increase of poultry. In Orange County it was felt that a possible increase of 10 per cent would be realized,

notwithstanding the high price of feed. The small poultry raiser in some cases might profitably grow milo in the home garden following early vegetables, and thus make it more practicable to retain his flock.

Rabbits.—In general the increase in rabbit production was looked upon as a home enterprise. Only isolated cases considered this a commercial industry.

The hog population is believed to be below normal (Imperial Valley especially). No accurate counting is possible at present to verify this opinion. With the increase in milo planting, especially in this valley, it seems safe to encourage the production of swine even above the normal number. The marketing of hogs is not on a satisfactory basis in Imperial County; there is an apparent discrimination against even the corn-fed hog of this section. Alfalfa-fed and poorly fitted stock of the past may be responsible in part for this unfavorable differential. Steps should be taken to assist the hog raiser in the proper marketing of his product.

The probability of increasing the livestock in general seems doubtful. There is an apparent shortage of all kinds of grain hays and in general the production of alfalfa is below normal. This is due in part to the breaking up of large areas of forage land in Imperial County for the production of cotton, and a similar reduction of hay land in the coastal counties due to the increased bean acreage.

Vegetable Supply.—Local supplies of vegetables in southern California come to a considerable extent from without the counties. In Los Angeles and Orange Counties the local demands are largely met and quantities are exported. This condition is explained in part by the fact that soil and climatic conditions, and the proximity to the large quantities of stable manure to be had at a reasonable price, makes the section around Los Angeles especially well adapted to the production of vegetables. The opinion prevails in many of the outlying sections that the general vegetable markets of the community can be supplied more economically from without the county than from within.

Home vegetable gardens, however are much more common this year than usual, with possibilities of increasing the total production of vegetables. In San Bernardino County it is estimated that the production from home gardens will exceed the normal about 150 per cent. There is a need in many localities of public instruction in garden making, to be followed up throughout the summer months. The high-school instructors in agriculture might well be enlisted for this work.

The farming of vacant city lots is looked upon from many different angles. It depends in part on the adaptation of the soil for vegetable gardening. In such sections as parts of Los Angeles, Ventura, and Orange Counties, where natural conditions favor vegetable production, the farming of city lots may be followed with success, if the people are already equipped with the necessary tools and the water rates are low. However, the production of vegetables on city lots which are not adapted to agriculture and by people who are not farmers may be a questionable procedure.

Crop Pests prevailing in the sections visited include the various insects and diseases on fruit trees, which as a whole are well controlled. The grain and hay pests come in for only normal consideration, except in Imperial Valley, where the grasshoppers periodically do an excessive amount of damage. The bean aphis is prevalent in the coastal areas, but there is a great diversity of

opinion as regards the damage done by this pest. Some farmers even maintain that the plant infested with aphis is as productive as a normal one.

There is a persistent demand for better squirrel and rabbit control in the back country of San Bernardino County, and in the Goleta section of Santa Barbara County. Apparently there will be an unusual number of aphids on the cantaloupes in the Imperial Valley, and on the walnut trees of the coastal counties; this damage is considerable every year. There is considerable complaint against the damage done by birds to the milo crops and the apricots in both San Bernardino and San Diego Counties, where these crops are grown in small isolated areas.

School Vacations usually coincide with the need for the child's assistance on the farm. In Imperial Valley, however, climatic conditions make it imperative that the vacation come in the summer rather than during the season of the peak-load of farm labor. In the walnut sections, the opinion prevails that in many cases a vacation should be given at the time of walnut harvest, as the children are very efficient in this work, and it is light and clean labor. For this purpose, vacations should occur in October. Some opinions indicate that the vacation normally coming at Christmas could better come in October in this emergency, as the vacation at Christmas time is practically useless so far as farm labor is concerned.

II. CENTRAL COUNTIES

(Including all of the San Joaquin Valley)

By B. H. Crocheron

Crop Indications.—The grain crops of wheat, barley, and oats will evidently be low during the present season. The acreage has increased some ten to twenty per cent in most counties, but the condition is poor, induced by the long, cold winter and by the lack of the normal amount of rain. The condition of the crop was poorer in the lower part of the San Joaquin Valley, outside of the sections where irrigation is practiced. In irrigated regions the grain crop appeared to be normal. Apparently in some counties more effort had been used to increase the acreage of wheat than that of barley. Evidently, all sections of the counties that could be easily sown to grain had been planted during the past winter in response to the high prices of grain in the market.

Fruit conditions were normal, or slightly above normal, in the five northern counties of the San Joaquin Valley, but in the lower part of the valley were far below normal. Indications were for a poor crop of deciduous fruit south of Fresno.

Summer crops, such as sorghums, beans, rice, corn, sweet potatoes, sugar beets, melons, etc., will undoubtedly be greatly increased. In many cases these increases range from 100 to 500 per cent, planted. This results from plantings in young orchards and vineyards and by sowing second crops on irrigated land. What the yields of these summer crops will be is yet too early to determine, since many of them are only now being sown, or in some cases the land is being prepared for later sowing. Shortage of seed is a serious consideration in many places where the farmers are unable to learn readily where supplies of seed can

be obtained. In general, the high price of seed was not the ruling factor, but rather the lack of knowledge of definite places where the exact kind of seed could be had at a known price. Many local seed houses were entirely exhausted of their supply of feterita, milo, and other sorghums, as well as Tepary beans, Blackeye beans, etc.

Replanting.—Except in certain sections where irrigation was possible and where sub-irrigation prevailed, in the delta regions or close to rivers and sloughs, it was too late and the rainfall had been too deficient to plow up poor stands of grain for planting of sorghums during the present summer. No considerable acreage appeared where this practice could be advocated.

Intercropping.—There appear to be about 45,000 acres of young orchards and vineyards which will be intercropped during the present season with summer crops, such as grain sorghums or beans. Much of this land was apparently going into beans because of the high price of that product. In many cases it was in areas where beans had not previously been extensively grown. It appears doubtful whether beans will be always successful or whether the owners of the land fully understand the culture of that crop. It would doubtless be to the advantage of the food supply of the state to advocate the planting of grain sorghums more extensively where beans are now contemplated, except in cases where bean culture is thoroughly understood and where the farm practise is established.

Extension of Irrigated Areas.—In some of the more northern counties of the San Joaquin Valley, it is possible, in certain sections, to extend the area of irrigated lands. This will probably not result during the present season, since the land must be leveled, and in many cases the capital is lacking to undertake that work. For example, in the Turlock irrigation district it was estimated that there were 70,600 acres of irrigable land under the ditch for which water was available, provided the land was leveled. Settlers moving into that region had funds for the leveling of only a part of their land and had maintained a practise of leveling additional acres as funds were available. The 70,000 acres now unleveled and unirrigated represent the balance of the area. If means could be found to furnish capital to these settlers so that they, or agents for the irrigation district, could level that land, a considerable area would at once come under cultivation.

Farm Labor.—In general, labor appeared to be sufficient for immediate needs. Grave apprehension was felt, however, that later in the season there would be a great shortage of the usual itinerant labor. The practice and the plan has been to gather up in small towns bands of men to go about for harvesting work, picking of fruits, etc. If this itinerant labor should be lacking because of the army draft or because of higher wages in other occupations, there would be a very serious and immediate lack of farm labor in the San Joaquin Valley during the latter part of the summer. The number of itinerant men employed at the time of the "peak load" varied from 400 to 6000 men per county. Unfortunately, the "peak load" seems to occur about the same time over the entire San Joaquin Valley, namely, during the months of August, September, and October, the highest peak being about September 15th. Unfortunately, too, the schools have in the past gone into session sometime between the 1st to the 15th of September. Throughout the entire San Joaquin Valley, except in Kern County, it was felt that the postponement of the opening of schools to a month later would materially assist in meeting the labor situation,

since much work done is of such character that it can be undertaken by children in the upper grammar grades and in the high-school classes.

Farm Animals, Supply and Condition.—In general, the supply of farm animals is at present almost normal, but the conditions of these animals is poor and evidently will become poorer still, due to the shortage of pasture and the high price of feed. Pasturage appeared to vary between 30 and 60 per cent of normal; probably not more than half the usual pasturage being available during the present season. It is expected that large numbers of cattle and hogs will be marketed owing to an immediate shortage of feed. In the lower San Joaquin Valley large numbers of hogs have been sold out during the late winter and spring owing to the shortage and high price of feed and the failure of the early alfalfa, resulting from the cold weather. This condition is equally true of poultry, since the poultrymen who purchase feed are unable to cope with the high price of grain, and are selling off their flocks very rapidly. Every possible effort should be made to warn ranchers that high prices for animals and animal products will obtain indefinitely and that they must maintain their breeding stock regardless of cost for feed. Undoubtedly the large crops of sorghums will later help out the situation. Because of the very late and cold spring, it was generally felt that one cutting of alfalfa had been lost; where five cuttings are usually made, growers believe they will obtain but four; where four cuttings are usual, probably only three will be secured. This will have an enormous effect upon the animal carrying-capacity of the San Joaquin Valley. Everywhere the opinion prevails that silos should be largely built by farmers who can afford them and that their use would greatly benefit the dairymen and stockmen. Undoubtedly, the silo has become popular in the San Joaquin Valley. Silo campaigns can well be promoted in all counties from Stockton to Bakersfield. In Stockton and Modesto the town garbage is used to fill in land. In both cities the authorities were requested to pass an ordinance requiring householders to separate the garbage from other waste products in order that it might be fed to hogs. Straw is finding a wider use for feed than it formerly had and in all sections where the farm area was small and the population dense, straw appears now to be used. In counties where large grain areas exist the straw is still being burned; this practice, however, appears to be dying away.

Making Farms Self-Sustaining.—In general, it appears that about 50 per cent of the local supply of vegetables is raised, the rest being imported from special vegetable growing regions. The restraining factor is often the scarcity of water, so that ranchers cannot successfully grow vegetables in competition with specialized vegetable growing regions, or more often it is generally accepted that a vegetable garden is not worth bothering with. Undoubtedly propaganda should be made to try to induce ranchers to maintain a family vegetable garden. In many cases flocks of chickens or one or two brood sows are not maintained on the ranches. This can be increased by public attention being called to their value in the present crisis when high prices for food products are prevailing. A general campaign of effort to make farm homes supply the needs of the farm family will in the present state of public opinion have a good effect upon the farm population and should be promoted in every way possible.

Better Use of Irrigation Water.—In many sections the irrigation companies have difficulty in delivering sufficient irrigation water after the middle of the summer. The irrigation companies claim that this is due to the lack of conservation on the part of the farmers, who use more water than is necessary,

and that this in turn creates a water shortage. It is undoubtedly also true that water storage should be increased. It appears that the snowfall in the Sierras has been low during the past winter, and that although this water supply has been held in the mountains until the late spring, there will, nevertheless, be a serious shortage in some districts during the present season.

Due to the recent decision of the State Railroad Commission, companies supplying power for pumping are collecting bills closer than in the past, and many farmers find themselves unable to pay their power bills or their fuel bills for distillate and other oils used to run engines until the end of the season, when their crops give them money in hand. The companies, meanwhile, are insisting upon a thirty-day payment of purchases, and many idle pumping plants result. For example, in Tulare County the Mt. Whitney Power Company reports that they have an actual census of 216 gas engines of over 2000 total horsepower now not in operation, and that there are also 161 motors, totaling over 1500 horsepower, which are not connected with their power lines. The representatives of the company, however, were unwilling to state whether or not it was due to the more close collection of bills which is now practiced by that and other companies. An extension of credit for the purchase of power and for the purchase of fuel oil is needed in these areas.

Conclusions.—The general situation in the San Joaquin Valley is somewhat depressing, due to the weather conditions which have prevailed during the past winter and spring. These, however, being beyond control, can merit no more than passing mention.

The bad weather conditions may be offset by the fact that farmers are doing everything possible with their present knowledge and resources to increase the area and yield of crops. They realize generally that higher prices will prevail and that this is an opportunity to make unusual profits. There also is undoubtedly a widespread impulse to assist the nation in every way possible and to attest their patriotism by increasing the food supply of the state. Their limitations, however, are acute because of a lack of funds in hand or credit obtainable to extend farm operations. They are also restrained by fear of a labor shortage which will be so serious as to prevent the harvest of the crop.

General Recommendations

(1) *Finance.*—There are undoubtedly farmers who are unable to obtain sufficient credit, due to the fact that their farming was started on a "shoestring" as new settlers and they have not yet been able to obtain sufficient capital to extend their credit. While their local bank has sufficient funds, and is desirous of extending credit so far as possible, it is limited by the banking laws and the wisdom of not taking undue risks. It is highly desirable that a considerable sum of money be set aside by the state or some philanthropically inclined persons whereby farmers without banking credit who are approved by some state or federal agency on the basis of the quality of their land and the character and knowledge of the operator, could obtain loans upon unendorsed personal notes or upon their promise to pay at the time of harvest.

(2) *Labor.*—Some central organization should exist in each county whereby the labor needs of the farmers may be codified. These needs may be cleared through other agencies at local or distant points whereby available, itinerant, competent farm labor could be gathered together and presented for the needs of the farmers. It was quite apparent, for example, that in the San Joaquin

Valley during the late summer months unusual labor demands will be made this year to harvest the greatly increased acreage of summer crops. These labor demands drop off sharply at the end of October or beginning of November, when thousands of laborers would be available for transportation to Imperial Valley, for example, for the harvesting of the cotton crop. A county farm bureau which employed a labor clerk could catalogue all demands for laborers from farmers and should be able to present the labor needs of the county in such form that it could be met by labor-collecting agencies in the large cities.

(3) *Information.*—A more intensive system of supplying farm information to ranchers is needed in all parts of the San Joaquin Valley. The present farm adviser system should be extended and intensified to embrace all types of information to farmers which could have a direct bearing upon the growing of crops. For example, farmers should be supplied with immediate information regarding the purchase of seed; the exact methods of planting new crops; the best varieties of grain sorghums to plant; the methods of harvesting beans; the erection of silos; the growing of silage crops; the use of garbage; the feeding of straw and other by-products. They should also be informed of the probable trend of markets, the current prices, the best methods of marketing their products, the type or condition of the product that the market wanted, and similar information. Undoubtedly in most counties of the San Joaquin Valley one farm adviser and four or five assistants could be kept busy throughout the entire season giving a real informational service to the growers.

III. SOUTH COAST COUNTIES

By W. T. Clarke

San Mateo County.—The great handicap in this county is to be found in unoccupied, undeveloped subdivisions of land that are of high agricultural value. There are from ten to fifteen thousand acres of land on the bay side of San Mateo County, and some five thousand acres on the ocean side of the same county, which could be used for intensive agricultural work, providing labor were available to handle the lands in question. It was brought out in the inquiry that for proper agricultural work in San Mateo County about one man to seven acres is necessary. The county is a big producer of certain truck crops, notably artichokes, cabbages and cauliflower. Unless the labor is furnished, the acreage heretofore mentioned cannot be developed. The school-vacation periods are so arranged as to make the young people's work of most use to the farmers.

Santa Clara County.—Investigation showed that it requires for the ordinary working in this county, about one man to twenty acres, throughout the year. For the peak load of labor in July, August, and September, greatly increased forces are necessary, meaning by this term "greatly increased," about one man, boy or woman to two acres; this in handling the fruit in the orchards, in the drying yards, and in the canneries. This labor supply is not handled locally, but must come in from abroad. The interesting fact brought out was that while San Jose, the largest town in the county, has arranged its school vacations to meet the labor demands, the country schools as a rule have not so arranged their vacation periods, and as a consequence the country school labor supply is not available at the time when most needed, that is, in the fruit season.

This condition can be readily overcome if the school trustees choose to take action.

San Benito County.—The interesting fact shown in this county was that a considerable acreage could be placed under irrigation, providing it were possible for two electrical power companies to operate in the county. There are two power lines across the county at the present time. Only one of these power lines is, however, permitted, under the State Railroad Commission rulings, to operate there. Since the investigation, arrangements have been made by the Railroad commission to permit the use of power from the non-operating company in this county. If this is finally consummated it will mean the addition of many hundreds of acres to the irrigable area in that county for 1918. The same question of labor that arose in the previous counties noted is also found here. The county is a large producer of seed and also of sugar beets. Orientals are used in this work. Also, during July and August, from 500 to 800 white campers are used. The local supply is barely enough to meet the ordinary demand and does not meet the peak-load demand. For development in this county, under the intensive cultural methods there used, it requires one man to each ten acres to properly carry the crops.

Santa Cruz County.—Generally speaking, conditions of crops in the county are thoroughly good. The labor in the county is sufficient for present needs. It would require some three thousand men to develop fully the agriculture of this county. There are some ten thousand acres of land in Santa Cruz County that could be irrigated by the use of gravity ditches and by pumping. The labor situation here is bad, and any increased cropping presupposes a development in the labor forces.

Monterey County.—The same problem of needed labor supply was evident also here. The county requires about a thousand extra hands during the beet harvest, and these hands are usually supplied by floating labor, campers, etc., though there are a number of Japanese, Filipinos, and Hindus working in the county. Increase in agriculture in the county will depend upon the increase of the labor supply. In this county also there are two power companies serving the needs of the county, and serving them well. It developed in the inquiry in Monterey County, that the common bush rabbit and cottontail rabbit were doing an immense amount of damage, and resolutions were passed by the people assembled, requesting a modification of the protection of these creatures so that their numbers might be materially reduced and the losses caused by them reduced.

San Luis Obispo County.—In this county there are about 175,000 acres of land which are not now used under intensive agricultural work because of difficulties in transportation. This land lies in the neighborhood of Cholame and Shandon, and would not be usable until road systems are developed which would make it more readily accessible. The tract could be used in 1918 and afterwards if roads were provided. The county is fairly well supplied with labor, though there is not enough to carry the peak load. This has to be done by outside help, but is fairly well taken care of at the present time by campers and through city employment agencies.

Alameda County.—The high light points in this county were again the matter of labor to carry the "peak load," and also necessary additions to the regular labor force to increase agricultural production in the county. Generally speaking, the conditions are normal, though there is undoubtedly evidence of a

falling off in stock production, owing to the earlier overstocking of certain of the ranches.

Contra Costa County.—In the words of one of the people in attendance, the labor situation seemed to be about this: "If we sell our products for better prices we do not begrudge paying labor more money, but we cannot see where the summer help in sufficient quantity is to be had at any price. Something must be done." The labor situation seems to be acute in this county. The Oriental is leasing orchards and is not available as formerly for farm work. There will undoubtedly be heavy losses in truck crops and in the fruit in this county on the rich delta lands if the labor problem is not solved.

San Francisco County.—The fact was brought out that there was a very considerable amount of labor available in San Francisco and in our other larger towns, providing this labor could be placed directly in touch with the demand in the country districts. A feeling of uncertainty, however, was expressed as being prevalent among those who sought work. They did not seem to be able to get into touch with the work in the country.

Summary.—In all of the counties visited the fact was brought out that ample capital was available and could be obtained by individuals desiring to use that capital for crop development. There is no tendency apparent, at least on the part of the banks, to hold back credit. The usual precautions as to security, of course, are demanded, but no unusual demands are being made and the person who is a good risk can have all the capital necessary on short notes for agricultural work.

The survey emphasizes the very pressing necessity of a fuller development and classification of the work offered in the country, and a fuller development of the forces seeking labor from our centers of population. Some form of getting the employer of labor and the worker in touch with one another is absolutely necessary, and because of the facts observed in the survey, the suggestion is offered that the labor forces, both adult and youth in our cities, be tabulated and classified so that it will be possible to get into touch with this labor readily, and that the labor demands in the country districts be also thoroughly canvassed through some central agency, so that the laborer and the employer may be brought together. This would necessitate studying the situation very carefully, both in the city and in the field, so that both the employee and the employer would be thoroughly protected. It would be possible to use the high-school teachers throughout the state as developing forces in getting at the supply of labor in the cities and towns, and where counties are supplied with county farm advisers it would be possible to get this labor supply in touch with the demand very readily. Where such organization as are under the control of the farm advisers do not exist, new organizations could be developed which would bring about this connection.

It is very evident that the farmer, both from patriotic motives and also from a knowledge of the fact that good prices may be expected for farm products, is doing his best, under the climatic and soil conditions prevalent, to bring about heavy production of crops. It is also evident that without more man power he cannot obtain the best results.

In the counties visited, the matter of the use of the tractor is as yet of minor importance. It is true that there are certain sections in the Salinas Valley where some of the work can be done by tractors. However, those sections are well supplied with tractors. The main work is intensive in its char-

acter, requiring careful labor with the hoe and other such implements, and unless man power is developed in these counties, agricultural development cannot be greatly increased.

IV. INYO COUNTY

By V. C. Bryant

The general conditions of this county are somewhat below normal at the present time, owing to the late spring and the hard winter which has just passed. In general, the county cannot be considered as an intensive agricultural locality. There are a great many crops, such as potatoes and beets, that could be produced in this locality were it not for the fact that freight rates are too high to enable the producer to ship them out at a profit. One thing that would stimulate the agriculture of this locality very much would be to reduce freight rates upon agricultural commodities or secure some special rates as, for instance, a potato rate, fresh-fruit rate, etc.

Crop Indications.—The indications are that the acreage of potatoes, wheat, and sugar beets will be increased this year. Other crops are about normal or a little below normal, owing to the lateness of the spring.

Replanting and Intercropping.—There is practically no replanting to take place in this county that can be observed at the present time. The spring crops are not as yet planted and it remains to be seen whether or not replanting will be necessary with these. The young orchards in this county are for the most part intercropped, but the acreage of these is not large.

Extension of Irrigated Areas.—It is estimated that there is water enough in this valley to irrigate between 150,000 and 200,000 acres, whereas, at the present time, only about one-half of this amount is being irrigated. If some systematic distribution of the water, under some constituted authority, was put into force, a great deal of land which is now producing sagebrush could be converted into alfalfa fields and other fields of production.

Drainage.—There are about 50,000 acres of land in Owens Valley that are badly in need of drainage. A high percentage of this acreage is now being used for pasture purposes, whereas, if it were properly drained, it would make very fine farming land.

Farm Labor.—Owing to the activity of the mines in Inyo County, the supply of farm labor is very scarce, and a committee has been appointed to get into touch with the various farmers of Inyo County and secure from them accurate information as to the amount of labor needed and the time when needed. When this information has been assembled there is a possibility that this committee may call upon the State Council of Defense to put them into touch with a source of labor.

Machinery and Seed Supply.—There is plenty of farm machinery available to work all of the lands that are under irrigation and can be worked with profit in this county at the present time. The available supply of seed potatoes and seed beans is somewhat limited, and the particular variety (Red Kidney) of beans which does the best in this county can scarcely be secured. Aside from potatoes and beans, there seems to be a sufficient quantity of seed available.

Capital.—There is plenty of capital available at local rates of interest (7 to 10 per cent) to carry on the normal agricultural operations of the county.

However, the drainage conditions might be improved and more land might be cleared and put under irrigation if there were a greater supply of capital at a reasonable rate of interest. As previously suggested, the acreage of this county could probably be doubled by making a more extensive irrigation system and by practicing a more judicious use of irrigation water, together with some drainage. To do this would require considerable capital.

Pasture Conditions.—The pasture conditions are below normal at the present time, owing to the lateness of the spring. A good share of the sheep and cattle are pastured on the national forests throughout the summer, and a good deal of this forest range is not in Inyo County, but is in Mono and other bordering counties.

Livestock is by far the greatest agricultural product of this county. There is some dairying throughout the county. According to estimates there are about 20,000 head each of cattle, sheep, and poultry, 3100 hogs, and 4500 horses. Last year 176,600 pounds of butter were exported from the county and about the same amount was consumed within the county. The stock is in poorer condition than it has been for many years, probably about 15 per cent below normal.

It is the opinion of the forest rangers of the Inyo National Forest that by expending a few thousand dollars towards installing additional watering troughs, making a few new trails and by seeding some denuded areas, the carrying capacity of these ranges could be very materially increased. This is especially true of the sheep ranges. It is recommended that these ranges be improved in this time of need.

Land for Summer Fallow.—There is no land available for summer fallow in this locality, owing to the fact that the rainfall is not sufficient to make dry farming profitable. All the tillable land must be irrigated.

Vegetable Supply.—About one-half of the vegetables used in Inyo County are shipped in. It would be possible to supply the greater amount of these locally should the people desire to do it. There is room for some campaign work along this line.

Crop Pests.—There are no crop pests in this county which do appreciable damage.

School Vacations.—School vacation comes at a time when the boys are of the greatest service to the farmers. The vacation period is from the first of June to the first of September.

V. EASTERN COUNTIES

By W. L. Howard

Conditions in all of these counties are very similar, in that the chief industries are mining and grazing. Farming, as a business, has been given little attention except in a few of the larger valleys in the lower foothills bordering on the San Joaquin Valley. The people as a whole, whether they live in town or country, buy nearly everything they eat. While this is not literally true, as home gardens and isolated fruit trees are widely distributed, they are not as numerous as they should be. Poultry are scarce, as well as hogs, sheep, and milch cows.

Before the output of farm crops can be greatly increased, water for irrigation purposes must be provided. Also the small farmer must be assured of

a market for what he produces, as many can ill afford to buy seed at the prevailing prices unless they are practically certain of a ready sale at prices commensurate with the cost of seed.

Range feed everywhere was reported so short that cattlemen declared they would be fortunate if they were able to finish off 50 per cent of their cattle holdings. Without exception, the big cattle owners had little hope of being benefited by the prospective increase in summer forage crops that might be grown this year. It was their belief that they would not be able to pay the prices for feed that would be demanded by the valley farmers. However, it was agreed by all that the small ranchers might find ways of growing enough feed to enable them to provide their families with both meat and milk, neither of which is now produced in sufficient quantities to supply the rural communities and small towns.

These counties afford a fertile field for missionary work along the line of increased crop production from tilling the soil. The citizens of Calaveras County evinced an especially keen interest in learning how to grow summer forage crops, such as the grain sorghums and Sudan grass. Everywhere there was a great willingness to learn about the new crops and how to grow them. Local committees were appointed in each of the counties for the purpose of continuing the agitation for increased food production, and with a little assistance from the state and national government, undoubtedly much good will be accomplished.

Crop Indications.—While the foothill or mountain country is not a grain- or alfalfa-growing region, these crops are produced in all of the counties to a limited extent. Amador is perhaps the largest producer of grain and forage crops. There barley, wheat, and oats are grown chiefly for the grain, while in the other counties they are produced chiefly for the hay. On the whole, the grain acreage is normal to a little above, while the condition was reported to be from 10 to 20 per cent below normal on account of shortage in spring rainfall.

Replanting and Intercropping.—The acreage of grain in poor condition that could be plowed up and planted to summer crops was reported to be very limited. In a few instances this might be done if irrigation water were available.

There are practically no orchards that can be intercropped, as orchards are scarce except at high elevations and irrigation water is not available. A small acreage might be intercropped without irrigation.

Extension of Irrigated Areas.—Very little land in these counties is now under irrigation, but the people were nearly unanimous in their belief that the irrigated area could be extended, particularly in the Jackson, Ione, and Shenandoah valleys in Amador County, where 5000 acres or more could be watered by diverting water now used for power purposes. In Calaveras County there are extensive ditch systems which could be utilized at a comparatively slight expense by water secured from the Mokelumne River.

Farm Labor.—In the main there was to be found enough help to take care of such crops as are being grown, but if the crop acreage is to be increased, extra help in proportion will be needed. Nowhere was there found a surplus of farm labor. The time of peak load ranges from May to September, depending upon the kind of crops grown.

Machinery and Seed Supply.—Little shortage of farm machinery was found, although in a few instances more grain-harvesting outfits and threshers are needed.

No one reported stocks of agricultural seed on hand. Because of the fact that seeds of all kinds appear to be purchased each year as needed, owing to the present high prices many small farmers are barely able to plant in a small way and wholly unable to increase their plantings.

Capital.—Money was reported plentiful by the big ranchers and scarce by the little ones. It was apparent that many earnest, hardworking settlers need financial help if they are to increase their crops.

Pasture Conditions.—The carrying capacity of pastures was found to be 25 per cent to 50 per cent below normal. This was attributed to the scarcity of rainfall during the spring. In some sections, particularly in Tuolumne County and in Mariposa County, the grass came up as usual, but on account of the dryness of the soil it began to turn brown when yet too short for grazing.

Resolutions were presented at meetings held in Tuolumne County, also in Mariposa County, asking that that part of Yosemite Park north of Yosemite Valley be opened up to grazing during the present season. It was estimated that this extra range would take care of about 10,000 cattle or their equivalent in sheep. This request has since been granted by the Department of the Interior.

Land for Summer Fallow.—Thousands of acres of grass land that could be summer fallowed were reported throughout the district. Since comparatively little farming has been done heretofore it is unlikely that much will be done this year in order to promote heavier crop production in 1918, unless local committees or other agencies continue to carry on a vigorous agitation. If farm advisers were available in each of these counties, or even if a man could travel from county to county and constantly advise with the farmers during the present season, there is no doubt but that crop production could be materially increased in the near future.

Live Stock.—The number of live stock on hand was reported as normal, but their condition is somewhat below normal on account of the shortage of range which left the stock in bad condition. It was believed that the number of cattle could not be materially increased because of the lack of feed. Stockmen were unanimous in saying that without more feed they could not hope to finish off more than half their present number of cattle. There appears to be no waste of straw, all of it being used to feed live stock.

There seems to be an opportunity for the agricultural organizations of the valley region to get busy and either purchase half-finished cattle and finish them off with feed that will be grown this summer, or make arrangements for selling their grain and roughage to the cattle owners of the mountain regions at reasonable prices. In this connection the cattle owners ought to be urged to fatten their cattle at an earlier age than they have been doing in the past. It was conceded that silos would increase the live stock carrying capacity of the counties, and building material for either wood or concrete silos seems to be abundant.

It was very apparent everywhere that poultry and rabbits could be very greatly increased, perhaps by a hundred per cent. Many objected to this suggestion because feed is too high-priced to permit of buying it for growing poultry. However, it was pointed out that there is scarcely a farmer that could not produce enough grain sorghum, sunflower seed, and alfalfa to feed perhaps several hundred head of both rabbits and poultry. While rabbits will thrive on alfalfa, both green and dry, the flesh is not firm enough to command a good price in the open market unless the animals are finished off on grain of some kind.

Vegetable Supply.—Only 10 to 25 per cent of the vegetables now used in the mountain counties are grown locally. There is a vast field here for growing vegetables, not only in order to feed the population of the towns, but to take care of the large number of men employed in the mines.

The country in this section is not well adapted to growing large areas of vegetables in one place, but there are plenty of opportunities for growing such crops in special localities even though the plots might be comparatively small. In every community enough water could be found for irrigating small gardens.

Crop Pests.—No bad crop pests were reported except gophers and squirrels.

School Vacations.—In general, school vacations now occur at a time when the children are most useful on the farm.

VI. NORTH COAST COUNTIES

By T. Francis Hunt

Crop Conditions.—Since the north coast counties are not heavy producers of hay or cereals, the condition of these crops is of little importance. The acreage of these crops in Napa, Marin, and Sonoma counties is about normal, but the condition of the crops is poor. In the northern counties recent rainfall has made the outlook for these crops at least normal. The fruit outlook is reported above normal in every county. This is of particular importance in Napa, Sonoma, and Lake counties. Indications are for a heavy crop of prunes, apples, and pears. The trees have blossomed very heavily this spring. The good prices of these crops during the last few years have had the effect of making the growers more careful about the proper handling of the trees so that, as a rule, the trees are in better condition than normally and there should be a very heavy crop, barring unforeseen accidents.

Pasture conditions in the southern counties of this group are reported as only 50 to 60 per cent of normal. The winter weather conditions have been unusually bad. The winter was cold and the rainfall not only comparatively light, but it came in such a way that it did not help the pastures as under ordinary conditions and, as a result, the pastures are in an extremely bad condition. In the section north of Mendocino County where the pasture has been poor until recently, everyone seemed to be optimistic in regard to the pasture conditions for the remainder of the season.

The summer crops grown in this region are normally of little importance. Reports show a considerable increase in the acreage of corn, beans, and potatoes. While enthusiasm in regard to planting these crops is manifest and there is every indication that there will be considerable increase in the acreage planted, the total yield will not be such as to influence the food supply in the state as a whole.

Live Stock.—Beef cattle have come through the winter in poor condition and the general report was that herds would have to be reduced materially this fall on account of scarcity of feed. In some localities the cattle are unusually thin and would require very favorable weather and good feed to put them in condition.

Dairy cattle for the most part are in fair shape. Because of the high price of dairy products the dairymen have purchased mill feeds and alfalfa so that their herds have come through in very good condition. There is much discussion in regard to reduction of herds because of the extremely high prices of hay and concentrates and because of the difficulty of getting milkers.

The stock of hogs is extremely low, in most places being 50 per cent of normal. In a few small localities, the stock of hogs has been practically sold off because of the high price that has prevailed during the last year or so. Although this condition is true in certain localities, the general indications are that the stock would be reduced considerably further because of the high price of feed.

The supply of horses and mules is sufficient for farming operations. There appears to be a scarcity of horses that might be available for cavalry purposes. It was difficult to get a fair understanding as to the number of this type of horses because there seemed to be a great deal of difference of opinion as to whether or not the horses available would come up to the government specifications.

Farm Labor.—Farm labor was invariably reported insufficient. In two counties, Napa and Sonoma, the shortage of labor will be acute during the fruit-picking season and much can probably be done in securing labor, largely family labor, for these counties from June to September. In the other counties the lack of labor is not so seriously felt, although many farmers are looking for additional men and help is hard to secure.

Farm Machinery.—No serious lack of farm machinery was apparent in any county. In a number of the counties it was thought that additional tractors could be used, but there seemed to be no definite plan or any definite piece of land upon which to put these tractors. It may be safely said that if present conditions continue for another year or more, about twice the number of tractors could be used in these counties to advantage. In these counties, if the bean acreage continues to increase, as appears probable, the need for small bean thrashers will be very great, but it would seem that there will be ample time to supply this need.

Finances.—In this section of the state there is plenty of capital available locally to finance farming operations. However, a feeling was noticeable to the effect that production could be increased if there were some capital available to aid farmers whose security was none too good. In other words, there are many honest, hard-working farmers who could put in additional crops if they could be supplied with capital, while their security is of such a nature that it would be difficult to get the ordinary banking laws to cover them. It was hinted on numerous occasions that the state or federal government could well finance many of these farmers who are having some difficulty in getting capital to increase production.

The supply houses have their normal stock of cans and fruit jars or have contracted for them to be delivered and do not fear any shortage in this regard.

Recommendations.—The committee felt safe in recommending in every county greater effort to produce feed for live stock and that throughout the entire section the use of the silo could be extended to great advantage. There is no doubt but that the building of silos throughout all the northern coast counties would materially add to the live-stock carrying capacity of the section.

There are great possibilities, particularly in Mendocino, Humboldt, and Lake counties in raising of both potatoes and beans. These counties are not particularly well adapted to the growing of summer crops which require considerable heat, but both beans and potatoes do very well and other growth could be increased markedly. In these counties there are possibilites of increasing the production this year. We also feel safe in recommending the use of better stock. This applies particularly to hogs.

VII. NORTH CENTRAL COUNTIES

By H. E. Van Norman

Extension of Irrigation Areas.—Some steps should be taken to make available water in Placer and El Dorado counties. In both counties the general opinion was that the price charged for water is too great to permit of its use on the emergency crops. This matter should be taken up with the Western States Electric Company in El Dorado County and the P. G. & E. in Placer County.

In Placer County there is for this season a considerable amount of water going to waste below the power plant of the Pacific Gas and Electric Company, which could be diverted along the line of the stream and made available for the growing of crops east of Lincoln. Eventually, all this water will be used in ditches that are now under construction. The company said it could be diverted this season without any expense except that which would be incurred by the ranchers using the water, and local diversions can be made without prohibitive expense.

Colusa County reported a large area along the rivers which might be irrigated by pumping from the river and planted to a second crop.

Labor.—Rice growers anticipate a shortage of men and teams, also harvesters to properly handle their crop. They have tried to hire teams from outside districts. They complain of the inefficiency of the teams, and yet when we get the other side, we are told that the rice harvest is very hard on men and teams, and owners are unwilling to rent teams for rice harvesting because of the severity of the work.

In every county on the floor of the valley there was a demand for the universal closing of saloons to increase the efficiency of the present labor supply, by eliminating the loss due to the men laying off from one to several days after each pay-day, even though they come back to work after they are sober. It was also expressed that this would even bring a large proportion of the hobo class to work. There was a very insistent demand in several counties for some legislation or plan that would put to work the large number of men idling along the railroads who will not work when a job is offered to them, and yet they prey on the communities through which they move.

Butte County reported some land with water available by pumping, pumps and motors installed, which would not be cropped this season for want of someone to do the work.

Tehama County reported a 50 per cent decrease in the hop acreage, with a corresponding release of labor for other crops.

Capital.—There are a considerable number of small land holders in all of the newer settled section who have used all of their capital and credit for the purchase of their land and in most cases inadequate equipment of it, who could grow more crops if the purchase of seed could be financed. The amount of money involved in individual cases is not large.

Solano reported that men who were known locally can borrow needed funds for seed with resulting crop as security.

In Sacramento County it was pointed out that many of the small settlers are poorly equipped; they have a meager supply of farm machinery, they have bought poor horses, and generally speaking, are not supplied with facilities for proper handling of the land which they have.

Glenn County reported a shortage of binders for harvesting rice.

Feed—It is estimated there will be 100,000 tons of rice straw available, which, in the opinion of a number of ranchers who fed it last year, is valuable feed for carrying cattle through the winter. Some systematic organized effort should be made to have this saved and to have it available for the carrying of stock which otherwise may be short of feed.

One of Butte County's prominent farmers said, "If I had had one ton of rice straw per animal in the short months, my stock would have come through the winter 100 per cent better.

In the bean-growing area of these counties there is considerable bean straw which has heretofore been wasted, that might be made available for the feeding of sheep, and to a lesser extent for the feeding of cattle.

It was brought out in many counties that barley straw is still burned in large quantities.

Vegetable Supply.—Without exception the counties report that they are depending largely or wholly on outside shipments of vegetables to supply local demands. In a few cases they report that the mid-summer demands are supplied locally.

It is suggested that some serious consideration might be given to methods of and plans for encouraging the drying of vegetables; possibly the kilns used for drying hops might be adapted to the drying of vegetables, as well as the possibility of sun-drying.

In the district tributary to Sacramento there is a noticeable increase in the acreage of tomatoes and spinach being grown for the Libby, McNeil & Libby cannery.

School Vacations.—There seems to be a general concurrence of opinion that if the school vacation could be prolonged to the first or middle of October in the fruit section, it would materially help the handling of late fruits.

Intercropping.—Butte County was the only one that reported a general practice of intercropping in orchards.

Silos.—There was an appreciable interest in the building of silos in most counties and apparently a growing recognition of their value.

Poultry.—There was a noticeable lack of any general raising of poultry. There are a few people engaged in raising Belgian hares in each county that we visited.

VIII. NORTHEASTERN COUNTIES

By G. H. True

The general character of the six northeastern counties of the state, with the exception of the southeastern part of Shasta county, which extends into the Sacramento Valley, is very similar throughout. The region as a whole may be characterized as mountainous and of an altitude such as to give a climate comparable to that of the mountainous states north and east of California, and more or less like that of the middle west. Trinity County seems to stand by itself as a non-agricultural region, mining being the principal industry, a few cattle (estimates vary from 2000 to 5000 head) being the only export credited to the county outside of the product of its mines. Trinity County as truly as the British Isles is dependent upon outside sources for its food supply.

Character of Agriculture.—Speaking generally for these counties it may be said that the range livestock industry is the principal one. The object of farming is to produce winter feed for the cattle on the range, and such supplies as are required by the mines of the region. While some wheat may be shipped out, it is safe to say that larger amounts of flour are bought on the outside. The counties do not produce either the pork products or vegetable supplies consumed.

Possible Extension of Agriculture.—The most important extensions to the farming areas in these counties are to be made as a result of the development of irrigation. Important developments along this line are under way in Siskiyou county, where 5000 acres will be put under cultivation in the vicinity of Montague during the present year. In Strawberry Valley it is stated that 3500 acres could be put under irrigation through the construction of proper irrigation systems, there being an abundance of water now unused. In Shasta County the Anderson Cottonwood Ditch now under construction is supposed to furnish water for 12,000 acres of new land, 8000 acres of which will be cropped this year. In Lassen County a project contemplating the use of water from Butler Creek will bring under cultivation some 7000 acres of land. Extension of cultivated area by dry-farming additions could be made in Lassen County by the plowing of new land in Honey Lake Valley, and possibly in the Madeline Plains, also by the development of low-lying lands in Big Valley in the vicinity of Bieber, where 8500 acres of land capable of yielding thirty bushels per acre could be plowed this year ready to crop next year if power were available. A few hundred acres could also be added to the cultivated area in Surprise Valley in Modoc County.

Live Stock.—The number of head of live stock throughout these counties is practically normal, the ranges being stocked throughout to their full capacity. On account of the past hard winter the surplus supply of feed for live stock on the ranches is completely wiped out, it having been necessary to ship hay into some of the remote regions at a cost of as high as $30 a ton to save animals from starvation. The season is at least a month late and while the indications are for good pasturage later, the outlook for the season as a whole is for less than a normal condition of pasturage. Spring crops had not been planted throughout most of the farming districts. On the whole, an increased acreage of grain was predicted but nothing could be said concerning the character of the crop.

The conditions for marketing live stock in Modoc County especially have not been satisfactory. During the last season there was but a single buyer in the field and but one price was offered. The cooperative system of marketing cattle whereby more satisfactory market conditions may be attained is needed.

Crop Pests.—The most injurious of crop pests seems to be the ground squirrel which is common throughout the whole region and injures grain crops to the estimated extent of 5 to 20 per cent. One man made the statement that his crop was injured to the extent of $1.50 per squirrel.

Power.—Throughout these counties there seems to be a sufficient supply of horse and mule power for the planting of this season's crops. In the region named, however, where there is a possibility of an extension of dry farming, this increased area would be brought under cultivation only through the use of power not now available. Detailed reference was made in our reports from the field to tractors in the vicinity of Susanville that might be available for certain months; also in Siskiyou County, of certain tractors now in use on the new irrigation project at Montague which might be available for certain parts of the year.

It is thought that in Modoc County 250 head of horses weighing around 1300 pounds would be available for purchase after the grass had grown sufficiently to give them an opportunity to get into good condition. It is thought that 2500 head of horses and mules could be bought in Lassen County.

Labor.—In Shasta, Trinity, and Siskiyou counties there seemed to be no shortage of farm labor. Plumas, Lassen, and Modoc will need something like 2400 men during the season for haying and harvest in July, August, and September.

Capital.—Local banks throughout the six counties seemed to have sufficient money to finance all farm operations. Conditions under which money is loaned, however, are not such as to make it possible for the poor farmer whose land is of questionable value on account of climatic conditions, limited rainfall and unseasonable frost, to borrow money sufficient to take the necessary chances in the matter of cropping. It would seem advisable that some steps should be taken to bring before these people the possibilities of the use of the Farm Loan Bank. It is desirable, first, that they should have the advantage of a low rate of interest, and second, a just valuation of their land by such agency would result in a very much needed stabilizing of land values in regions where colonization is being attempted. Reference is made especially to the Madeline Plains in Modoc County and Butte Valley in northern Siskiyou County.

Summary.—In summarizing the situation in these counties it seems that urgent necessities lie along the following lines:

First, that every effort be made to increase crop production in order that meat-making animals from the range may be carried through the winter not only without loss, but without serious deterioration in flesh. Further, that steers to a larger extent than is now the case may be marketed from the range, making it possible to carry a larger number of breeding stock.

Second, that the range sheep men be urged to give most careful consideration to the possibility of improving the conditions of lambing practice to the end that serious losses now experienced be lessened.

Third, it seems advisable to urge families to make every effort to produce the home supply of vegetables, no matter whether living in villages or on farms. Also that farm cropping be so balanced that the counties in question grow their own supply of wheat for flour locally.

Fourth, co-operation in the distribution of products raised is very much needed, so as to avoid the same product being shipped out from one part of the county into another or into another county. Co-operation in the handling of labor should also be given serious consideration.

OUTSTANDING CONCLUSIONS FROM AN EMERGENCY IRRIGATION SURVEY OF CALIFORNIA BY THE COLLEGE OF AGRICULTURE OF THE UNIVERSITY OF CALIFORNIA CO-OPERATING WITH THE IRRIGATION INVESTIGATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, AND THE CALIFORNIA STATE DEPARTMENT OF ENGINEERING

ELWOOD MEAD AND FRANK ADAMS, *Committee*

Summary:

(1) From 1899 to 1912 the irrigated acreage in California increased from 1,466,000 to 3,200,000 acres, or at an average rate of 135,000 acres per year.

Owing to unsatisfactory land settlement conditions, this rate of increase was not maintained from 1912 to 1915, yet the indications are that 1917 has not only

brought a return to the normal, but that the widespread interest in increasing food production and, more particularly, the present high price of agricultural products have resulted in a very considerable additional seasonal increase for this year, possibly as much as 100,000 acres.

(2) Although, in the main, unavailable for use until qualified agricultural settlers have been placed upon the land, canals and principal laterals are already constructed sufficient to add an additional half million irrigated acres, and construction is now under way or arranged for, and due to be completed within three years, that will make irrigation water available to 300,000 acres more.

(3) Legal obstacles standing in the way of a more complete use of irrigation water controlled by public service and mutual water companies and individuals have been removed by action of the California State Railroad Commission and a special enactment by the legislature. Owing to the irrigation season being advanced when the war emergency arose, however, resulting opportunities for increased irrigation through the use of this surplus water have not been largely seized in 1917.

(4) Reorganization and consolidation of existing irrigation enterprises, completion of irrigation works now under way, efforts toward temporary or permanent adjustment of local irrigation controversies, and more complete and more careful utilization of regular irrigation supplies, have been definitely stimulated by the war emergency. A spirit of unwillingness to subordinate individual nterests involved in pending controversies over the use of water to the furtherance of the national good unfortunately, however, is not altogether lacking.

(5) If, in some instances, during the war emergency there can be a temporary exercise of superior national or state authority to stop waste of flood waters kept out of use through local differences but without permanent or substantial loss to those responsible for the waste, the effective additions to the irrigated area in California can be still further increased.

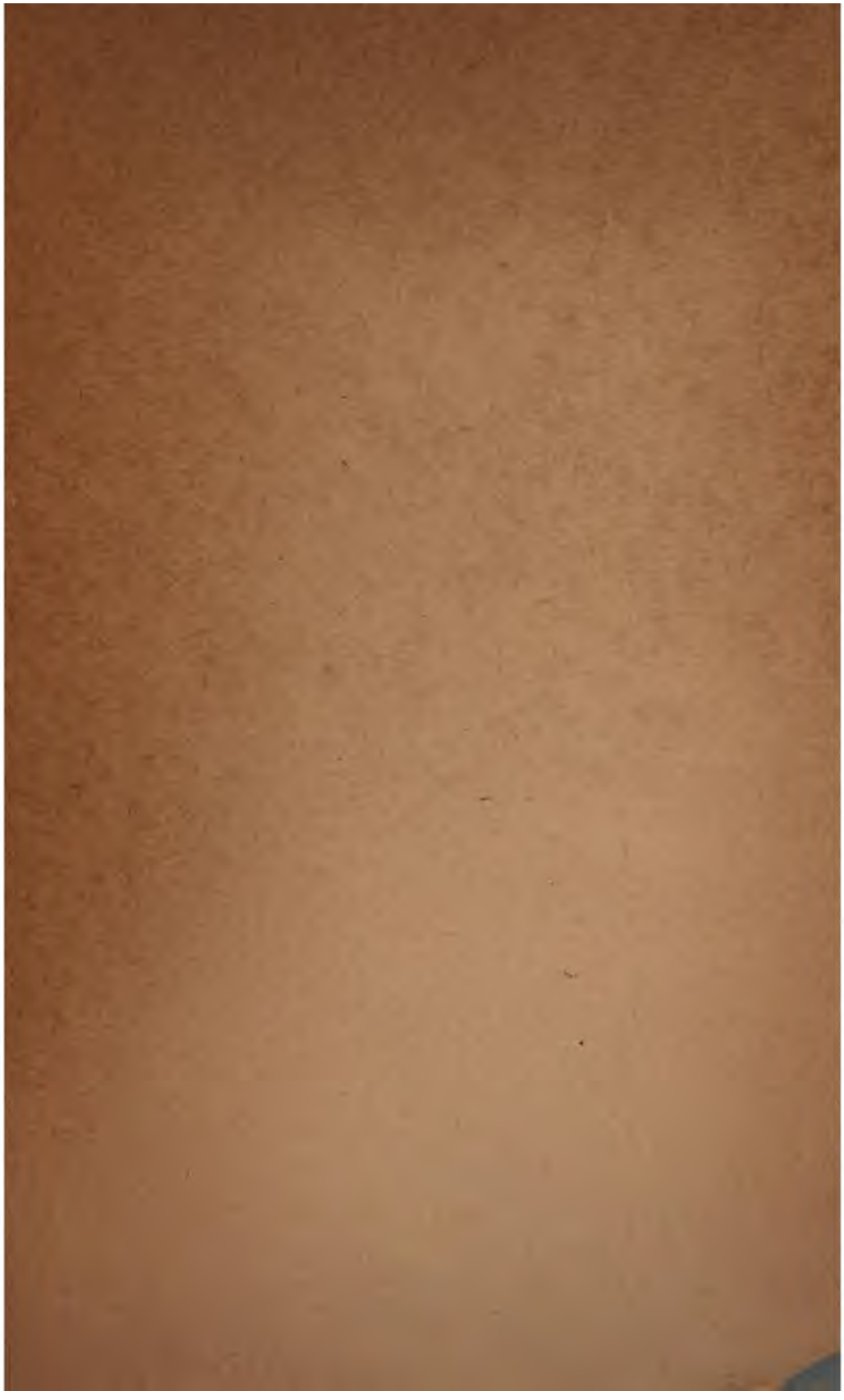
Recommendations:

There can be no question of the patriotic effort of many farmers and land owners throughout California to increase the irrigated area during the war emergency, nor of the great stimulus that has been given to increased production under irrigation by the present high level of prices of all agricultural products.

No enthusiasm for this response, however, should becloud the fact that while highly commendable and advantageous, the irrigation increases during 1917 will be much less than would be possible if either state or national authority were so organized as to force utilization where there is now waste and furnish financial aid and direction where these are essential.

It is too early at this writing to ascertain the extent to which surplus water is being utilized in 1917 under the emergency order of the State Railroad Commission and the special act (chapter 191) of the 1917 legislature permitting emergency deliveries by mutual water companies and owners of individual irrigation plants. It is recommended, however, that the general extent of such use in 1917 be ascertained later in the 1917 irrigation season with a view to encouraging the extension of such use in 1918 if found practicable and beneficial during 1917.

It is further recommended that additional investigation be made by the proper agencies as to the extent to which the use of irrigation water can be extended in California in 1918 and subsequent seasons during the continuance of the war emergency, provided it is found desirable to establish and exercise such higher

governmental authority as shall be found necessary to prevent waste and to force the temporary setting free, under conditions that will not jeopardize permanent rights, of all unutilized water that can be advantageously applied in irrigation during continuance of the need for maximum production.

Finally, it is recommended that the proper agencies continue the giving of advice and assistance to irrigators and irrigation communities in the practcal questions relating to the application of water to land and that every effort be made so far as lies within our means to insure that no irrigated land in California remains out of use during the period of the war through lack of information as to its location or as to feasible means of applying the irrigation water needed to make it productive.